Mistletoe

Mistletoe, often used for Christmas decorations, was also used by the ancient Druids who ruled Britain, Ireland, Scotland, and Germany before Christianity came to the Celts. When a full moon appeared, the Druids often gathered at a grove of sacred oak trees. After two pure white bulls had been killed and offered to their god Ba’al, a priest in a white robe used a golden sickle to cut mistletoe from the oak. As it fell from the tree, the plant was caught in a white cloth.

To learn why mistletoe was so important to the Druids, complete the substitution problems that follow.

ONE, substitute the given value in each expression, simplify to find the answer in the table below.

TWO, place the letter by the answer in the blank next to the problem.

THREE, match the numbers by the picture with the corresponding letters.

1. ___ $a + 7$ for $a = 5$
2. ___ $a - 7$ for $a = 3$
3. ___ $7 - a$ for $a = 3$
4. ___ $-c$ for $c = -1$
5. ___ $c^2 + 1$ for $c = -1$
6. ___ $-2h - 2h^2$ for $h = -3$
7. ___ $\sqrt{s} - 5$ for $s = 30$
8. ___ $ab$ for $a = 2$, $b = 4$
9. ___ $t^2 + 2s$ for $s = -5$, $t = -2$
10. ___ $\frac{ab}{2}$ for $a = 5$, $b = 4$
11. ___ $\pi r^2$ for $r = 7/2$, $\pi = 22/7$
12. ___ $t^3$ for $t = 3$
13. ___ $t^3$ for $t = -3$
14. ___ $abc$ for $a = 4$, $b = 0.5$, $c = 3$
15. ___ $\pi D$ for $\pi = 3.14$, $D = 5$
16. ___ $a - b$ for $a = 12$, $b = -3$
17. ___ $b - a$ for $a = 12$, $b = -3$
18. ___ $a + b$ for $a = 12$, $b = -3$
19. ___ $c^3 + 3c^2 - 5$ for $c = -1$
20. ___ $\frac{1}{2}gt^2$ for $g = 32$, $t = 1$
21. ___ $\sqrt{2gh}$ for $g = 32$, $h = 16$
22. ___ $\frac{1}{2}gt^2$ for $g = 32$, $t = 2$

A = 5      D = 27      I = -6      N = 4      S = -15      W = 9
B = 38 $\frac{1}{2}$  E = 1      K = 2      O = -4      T = 8      X = 64
C = -12     F = 15     L = 6      P = 16     U = 15.7     Y = -27

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8-19-4-13  11-4-14-9-4-21-4-12  11-7'-7-14  18-7-17
20-10-4-17-4-3-8  9-3  8-19-4  1-9-17-8-14-4-8-2-4.
12-10-15-9-12-17  1-9-22-4-12  8-19-4  20-14-7-3-8  18-9-8-19
18-7-8-4-10  7-3-12  12-10-7-3-5  9-8  7-17  7  6-15-10-4  16-2-10
7-14-14  12-9-17-4-7-17-4-17.
Ancient Lenape (Delaware Indian) believed that the Creator appointed a guardian spirit called Misinghálíkun (Living Solid Face) to look after all the animals of the forest and to help the people with their daily needs. He was sometimes seen in the forest riding on the back of a buck, herding deer. But, he lived in a range of rocky mountains above the earth. His face was round, the right side painted red, the left black. His body was covered with long dark hair as a bear.

The Misinghálíkun was the only spiritual being the Lenape represented by an image. On the posts of their Big House, there are twelve wood carved faces to represent him. Another representation is a wooden mask and costume used by an impersonator at the Big House Ceremony. But, sometimes parents called upon the impersonator to come to their homes. To learn why this was done, simplify the problems that follow.

**ONE,** simplify each expression to find the answer in the table.

**TWO,** place the letter by the answer in the blank next to the problem.

**THREE,** match the numbers by the picture with the corresponding letters.

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<table>
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<td>2</td>
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<td>8^2</td>
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<td>3</td>
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<td>11</td>
<td>___</td>
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<td>12</td>
<td>___</td>
<td>3 \cdot 2^6</td>
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<tr>
<td>13</td>
<td>___</td>
<td>1^5</td>
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<td>14</td>
<td>___</td>
<td>5^1</td>
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<td>2^7</td>
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<td>6^3</td>
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<td>18</td>
<td>___</td>
<td>2^3 \cdot 3</td>
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<tr>
<td>19</td>
<td>___</td>
<td>2^2 \cdot 3^3</td>
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<tr>
<td>20</td>
<td>___</td>
<td>(12)^2</td>
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</tr>
</tbody>
</table>

A = 64 \hspace{1cm} E = 5 \hspace{1cm} I = 24 \hspace{1cm} N = 128 \hspace{1cm} S = 36
B = 8 \hspace{1cm} F = 216 \hspace{1cm} K = 2 \hspace{1cm} O = 192 \hspace{1cm} T = 81
C = 16 \hspace{1cm} G = 1 \hspace{1cm} L = 25 \hspace{1cm} P = 144 \hspace{1cm} W = 32
D = 125 \hspace{1cm} H = 27 \hspace{1cm} M = 108 \hspace{1cm} R = 256 \hspace{1cm} Z = 625
5-12  17-6-18-13-3-5-14-15  2  1-3-18-9-10  5-12  13-14-5
6-18-10  12-17  4-14-2-7-15-14-16-16,  16-18-1-7-15-14-16-16,
The Tenth Muse

Although Mexico City was a man's world during the seventeenth century, Sister Juana Ines de la Cruz became so well known for her skill in writing poetry that she was called the *tenth muse*. Juana learned to read and write at the age of 3, at 8, the young girl won a valuable prize for composing a song. At 13, the talented girl was the leading intellectual at the viceroy's court and recognized as one of the greatest poets of her time. At 19, Juana gave up court life to become a nun. She devoted herself to prayer, teaching, and study. In 1695, Sister Juana died of smallpox while caring for the sick Indians of Mexico City. To learn more about Sister Juana, solve the problems below.

**ONE,** simplify each expression to find the answer in the table.

**TWO,** place the letter by the answer in the blank next to the problem.

**THREE,** match the numbers by the picture with the corresponding letters.

1. __ 3 \cdot k \cdot k
2. __ 3 \cdot 5 \cdot k
3. __ 4(3k)
4. __ (a + b)(a + b)
5. __ (ab)(ab)
6. __ (6x)(2y)
7. __ a \cdot b \cdot a \cdot b \cdot a
8. __ (x - y)(x - y)(x - y)
9. __ (4x)(3y)(z)
10. __ 5\left(\frac{a \cdot a}{b \cdot b \cdot b}\right)
11. __ (a - b)(a + b)
12. __ five times the square of a
13. __ 9 \cdot 3 \cdot 2
14. __ five times the cube of a
15. __ a(ab)
16. __ a(ab)(b^2)
17. __ three times the second power of \(a\)
18. __ \(ab\) to the fourth power
19. __ the quantity \(a\) plus \(b\), to the fourth power
20. __ three times the third power of \(k\)
21. __ \(a\) used as a factor four times
22. __ (5x)(5x)

\[A = 5a^2\quad F = 3k^3\quad J = a^2b\quad P = a^4\quad V = (a + b)^4\]
\[B = 5a^3\quad G = 5\left(\frac{a^2}{b^3}\right)\quad L = a^2b^3\quad R = 54\quad W = a^3b^2\]
\[C = (x - y)^3\quad H = 12k\quad M = (a + b)^2\quad S = 12xy\quad Y = 25x^2\]
\[D = 3a^2\quad I = 15k\quad N = (ab)^4\quad T = 12xyz\]
\[E = 3k^2\quad O = a^2 - b^2\quad U = (ab)^2\]

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The Spirit of the Evil Wind

In Yosemite Valley there is a thundering waterfall that Ah-wahn-ee-chee Indians call Po-ho-no, the spirit of the evil wind. They dread the plunging waters and hurry past with face turned away because they believe a terrifying spirit dwells within the pounding spray. His voice can be heard in the bubbling torrents below the waterfall, luring unsuspecting passers to their destruction. Po-ho-no’s victims are enslaved in a spirit world filled with torture and unrest. To learn how Po-ho-no’s victims were freed, work the problems below.

**ONE,** simplify each expression to find the answer in the table.

**TWO,** place the letter by the answer in the blank next to the problem.

**THREE,** match the numbers by the picture with the corresponding letters.

1. __ (4 • 4 • 4) 10. __ (a + b)(a + b)(a + b)
2. __ (3 • 3 • 3)(2 • 2) 11. __ 5² • 5³
3. __ a • a • a • a 12. __ a² • a³
4. __ (2 • a • a)(2 • a • a) 13. __ a³ • a • a²
5. __ (2 • a • a • a • a) + 2(a • a) 14. __ (ab)³(ab)²
6. __ (2 • 2 • 2 • 2) + 2 15. __ (3a²)(3a²)²
7. __ (2 • 2 • 2 • 2) 2 16. __ 2³ • 2² • 2 • 2²
8. __ 5(a • a • a) 17. __ (a³b)(ab³)
9. __ (a • a • a)(b • b • b)

A = 4a⁴  F = a⁴  M = 5a³  T = 2⁴ + 2  Y = (3a²)³
C = 2² • 3³  H = a³ • b³  N = a⁶  U = (ab)⁵
D = (a + b)³  I = 2a⁴ + 2a²  O = 2⁵  V = 2³
E = 4³  L = a⁵  R = 5⁵  W = a⁴b⁴
6-9-1-15  17-1-11-1  3-11-1-1-10  17-9-1-13  6-9-1-15
12-14-11-1-10  4  13-1-17  16-5-2-6-5-8  6-7  6-9-1-5-11
10-1-4-6-9  5-13  6-9-1  17-4-6-1-11-3-4-12-12.
**SHIPWRECK**

In his book *Shipwrecks*, Alvar Nunez Cabeza de Vaca left an account of the disastrous exploration of Florida under Panfilo de Narvaez in 1528. After eight years of wandering among hostile Indians, Cabeza de Vaca, the famous black explorer Estevanico, and two other Spaniards made their way to safety in Mexico.

According to the story, the Indians accused Cabeza de Vaca of bringing disease among them. They reasoned that he was a doctor and must be held prisoner to heal them. Although Cabeza de Vaca knew little medicine, he survived among the Indians by restoring them to health. To learn how this was done, solve the problems below.

**ONE,** simplify each expression to find the answer in the table.

**TWO,** place the letter by the answer in the blank next to the problem.

**THREE,** match the numbers by the picture with the corresponding letters.

1. \( x^2 \cdot x^7 \)
2. \( y^3 \cdot y^2 \)
3. \( y \cdot y^5 \)
4. \( (-3x^2)(-2x^4) \)
5. \( -3x(-2x^4) \)
6. \( -x \cdot x \cdot x \)
7. \( (xy)(xy) \)
8. \( x(y^2)(-yx^2) \)
9. \( x^a \cdot x^a \)
10. \( x^{a+1} \cdot x^{-a} \)
11. \( x^a \cdot x^{-a} \)
12. \( -3xy(-xy) \)
13. \( (-x)(-y)(-3xy) \)
14. \( x^{2a} \cdot x^{-a} \)
15. \( x \cdot y \cdot x \cdot y \cdot x \)
16. \( (x)^3 \)
17. \( xy^3(-x) \)
18. \( (x^2y)(xy^2)(xy) \)
19. \( x^{-a} \cdot x^{-a} \)

\[\begin{align*}
A &= 3x^2y^2 & E &= -x^2y^3 & I &= y^6 & O &= 6x^5 & T &= 1 \\
B &= x^9 & F &= y^5 & L &= x^3 & P &= -3x^2y^2 & V &= x^{-2a} \\
C &= -x^3y^3 & G &= x^3y^2 & M &= 6x^6 & R &= x & Y &= x^2y^2 \\
D &= x^4y^4 & H &= x^{2a} & N &= x^a & S &= -x^3
\end{align*}\]
City of the Gods

About 30 miles outside of Mexico City rests the ancient city of Teotihuacan, the city of the gods. It is a huge city built on a massive scale and set in precise mathematical forms. There are two great pyramids of the sun and moon dominating the surrounding valley. Between these are thirteen other religious structures placed in geometric relationship. Decorating the religious buildings are 365 stone carved figures, the same as the number of days in a year. The precise layout of the complex with its order and symmetry suggest that the city of Teotihuacan had great astronomers.

The city was abandoned about 900 A.D., but stories about it developed into fantastic myths about gods meeting there to create the sun, moon, stars, and man. To learn more the impressive city, solve the problems below.

**ONE,** simplify each expression to find the answer in the table.

**TWO,** place the letter by the answer in the blank next to the problem.

**THREE,** match the numbers by the picture with the corresponding letters.

1. ___ $x \cdot x$  
2. ___ $(xy)^2$  
3. ___ $(x^3)^3$  
4. ___ $(-xy)^4$  
5. ___ $-(xy)^4$  
6. ___ $(x^3)^3$  
7. ___ $x^4 \cdot x^3$  
8. ___ $(-x)^8$  
9. ___ $-x^3 \cdot x^3$  
10. ___ $(xy^2z)^2$  
11. ___ $(xy^2)^3z^2$  
12. ___ $(3x^2)^4$  
13. ___ $(-3x^3)^3$  
14. ___ $x(3x^2)^2$  
15. ___ $3x(6x)^2$  
16. ___ $x^{4a} \cdot x^{6a}$  
17. ___ $(x^4)^3$  
18. ___ $(x^3)^2(xy)^2$

$A = x^3y^6z^2$  
$G = x^{3a}$  
$M = x^{12}$  
$R = -x^4y^4$  
$V = 9x^5$

$D = -27x^9$  
$H = x^2 \cdot y^2$  
$N = x^8y^2$  
$S = x^4y^4$  
$Y = -x^6$

$E = x^{10a}$  
$L = 81x^8$  
$O = x^7$  
$T = xy^2z^3$

$F = x^2$  
$L = x^8$  
$P = 108x^3$  
$U = x^6$

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12-18  14-7-8-3-6-16,  12-10  12-4  8-11-5-17-16-5
10-2-11-18  10-2-16  17-5-16-11-10  15-9-5-11-6-12-13
7-1  16-17-9-15-10.
The Birds of Stymphales

According to ancient Greek legend, Hercules had to perform 12 tasks to win his freedom from the King of Argos. One of the tasks was to destroy the birds of Stymphales. Stymphales was a lake in Arcadia surrounded by dense forest that sheltered man-eating vultures that had steel feathers to pierce their victims. Travellers were terrified to enter the forest.

To learn how Hercules cleverly destroyed the birds of Stymphales, work the problems below.

**ONE,** simplify each expression to find the answer in the table.

**TWO,** place the letter by the answer in the blank next to the problem.

**THREE,** match the numbers by the picture with the corresponding letters.

1. __   \((-2)(3)\)   11. __   \(-a^2(-a)\)
2. __   \((-5)(-1)\)   12. __   \(-a(-3a)\)
3. __   \((-3)(-2)(\frac{1}{2})\)   13. __   \((-a)(-2a)\)
4. __   \(-2(-5)\)   14. __   \(-(2a)^2\)
5. __   \(-(-6)\)   15. __   \((3a)(-b)\)
6. __   \(-(-5)(-2)\)   16. __   \(-(a)^2\)
7. __   \(-2(3a)\)   17. __   \(-3(a)(-ab)\)
8. __   \(-(3a)(2a)\)   18. __   \(-(2a)(-3a)\)
9. __   \((2a)^2\)   19. __   \(-(a)^3\)
10. __   \(-(a)^2\)   20. __   \(-(ab)^2\)

<table>
<thead>
<tr>
<th>A = 5</th>
<th>E = -6</th>
<th>K = (a^2b^2)</th>
<th>O = -6a</th>
<th>U = 4a^2</th>
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<tbody>
<tr>
<td>B = (a^2)</td>
<td>G = -(a^3)</td>
<td>L = 10</td>
<td>R = 3a^2b</td>
<td>V = -4a^2</td>
</tr>
<tr>
<td>C = -(a^2)</td>
<td>H = (a^3)</td>
<td>M = 6</td>
<td>S = -10</td>
<td>W = 6a^2</td>
</tr>
<tr>
<td>D = 6a^2</td>
<td>I = -3</td>
<td>N = 3a^2</td>
<td>T = -2a^2</td>
<td>Z = -3ab</td>
</tr>
</tbody>
</table>
8-3-13-11  10-17-7-12-15-1  16-2-6-13-2-12-1-13-6,
11-1-17-16-9-4-1-6  5-2-18-1  2  4-7-9-18  17-2-16-20-1-13
16-2-9-6-3-12-19  13-11-1  10-3-17-13-6  13-7  6-7-2-17
2-10-7-14-1  13-11-1  13-17-1-1-6  8-11-1-17-1  11-1
6-11-7-13  13-11-1-5  8-3-13-11  2-17-17-7-8-6.
Los Voladores

*Volador*, a favorite entertainment in Mexico, dates back to the Aztecs. Four men sat on a platform on top of a tall pole. They attached one end of the rope to the pole and wound the other end around their ankles. The platform rotated to unwind the ropes. When the signal was given, the men, *los voladores*, would jump from the platform. As the ropes unwound, the men appeared to fly around the pole.

To learn an unusual fact about the ancient *voladores*, work the problems below.

**ONE.** simplify each expression to find the answer in the table.

**TWO.** place the letter by the answer in the blank next to the problem.

**THREE.** match the numbers by the picture with the corresponding letters.

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<td>-3(-5)</td>
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<td>2.</td>
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<td>-2(3)</td>
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<td>3.</td>
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<td>-(-2)^2</td>
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<tr>
<td>4.</td>
<td></td>
<td>(-2)^2</td>
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<td>5.</td>
<td></td>
<td>-1/2(-3)(-2)(-2)</td>
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<tr>
<td>6.</td>
<td></td>
<td>(2ax)^2</td>
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<tr>
<td>7.</td>
<td></td>
<td>-(2a)(-3ax)^2</td>
</tr>
<tr>
<td>8.</td>
<td></td>
<td>-2a(3x)(-a)^3</td>
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<tr>
<td>9.</td>
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<td>-ax·a^2x^2</td>
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<tr>
<td>10.</td>
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<td>-(ax)^2(-2)^3</td>
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<td>11.</td>
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<td>-3(ax)^2(-ax)^2</td>
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<td>12.</td>
<td></td>
<td>2a^2x(-3ax^2)^3</td>
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<tr>
<td>13.</td>
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<td>(-1)^5</td>
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<tr>
<td>14.</td>
<td></td>
<td>(-2a)^3·x^3</td>
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<tr>
<td>15.</td>
<td></td>
<td>(-ax^2)(3a^2x)</td>
</tr>
<tr>
<td>16.</td>
<td></td>
<td>(-1)^24</td>
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<tr>
<td>17.</td>
<td></td>
<td>-(ax)^3(2a^2x)</td>
</tr>
<tr>
<td>18.</td>
<td></td>
<td>(-3a)^2</td>
</tr>
<tr>
<td>19.</td>
<td></td>
<td>-(2x)^4</td>
</tr>
<tr>
<td>20.</td>
<td></td>
<td>2a(a^2x)</td>
</tr>
<tr>
<td>21.</td>
<td></td>
<td>2x(-2x)(-2x)(2x)</td>
</tr>
<tr>
<td>22.</td>
<td></td>
<td>-3(-5)x^2</td>
</tr>
</tbody>
</table>

A = -4     F = -8a^3x^3     L = -16x^4     P = -3a^3x^3     W = 1
B = -8a^2x^2     G = 9a^2     M = -1     R = 4a^2x^2     Y = -a^3x^3
C = 2a^5x^4     H = 4     N = 15     S = 2a^3x     Z = 16x^4
D = -3a^4x^4     I = 18a^4x^5     O = 6     T = -18a^3x^2
E = -6     K = 15x^2     U = 6a^4x

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The Mad Hatter

One of the peculiar characters from *Alice in Wonderland* is the Mad Hatter. His monstrous head crowned with a gigantic top hat, his insane tea-party where he stuffed the dormouse into a teapot, his nonsensical conversations are unforgettable. But, when Lewis Carol wrote his fairy tale in 1865, he based the character on a man named Theophilus Carter who was popularly known as the Mad Hatter. He lived in Oxford, England and wore tall top hats in imitation of the prime minister of England. To learn more about this unusual man, work the problems below.

**ONE,** change the word expressions to symbol statements and locate each answer in the table.

**TWO,** place the letter by the answer in the blank next to the problem.

**THREE,** match the numbers by the picture with the corresponding letters.

1. __ 2 more than $a$
2. __ 3 more than $3b$
3. __ 2 less than $a$
4. __ $2a$ more than 3
5. __ 3 less than $3b$
6. __ 5 times $a$
7. __ $a$ divided by 5
8. __ 5 divided by $a$
9. __ $2a$ plus $3b$
10. __ the sum of 2 and $3a$
11. __ $a$ less $b$
12. __ 3$b$ less 2
13. __ take 3$b$ from 2
14. __ the product of $a$ and $b$
15. __ $b$ less $a$
16. __ 3 less $ab$
17. __ 3 times the sum of $a$ and $b$
18. __ 5 more than 3 times $a$
19. __ 4 times $a$
20. __ take 5 from $3b$
21. __ the sum of $2a$, $3b$, and 5
22. __ the product of $2a$, $3b$, and 5

| A = a - b | F = 3b - 2 | K = 2 + 3a | P = 3 - ab | U = $\frac{5}{a}$ |
| B = 3a + 5 | G = 2 - 3b | L = 2a + 3b | R = 4a | V = b - a |
| C = 3b - 5 | H = 5a | M = 3 + 2a | S = 3b - 3 | W = 3(a + b) |
| D = 3b + 3 | I = $\frac{a}{5}$ | N = ab | T = 2a + 3b + 5 | Y = 30ab |
| E = a - 2 | | O = a + 2 | | |

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The Conquistadors

In 1531, Francisco Pizarro set sail from Panama with only 180 men in three small ships. His destination was Peru where he planned to conquer the mighty Incas, a highly developed nation stretching over 2,000 miles of coast. The Andes mountains were dotted with elaborate cities and fortresses the Incas had built; and their highways and water system rivaled those of the Romans.

Pizarro marched his conquistadores across thousands of miles of rugged terrain and deserts until they finally reached the Inca city of Cajamarca high in the Andes. There, Inca King Atahualpa, with an army of 40,000 men, was awaiting the Spaniards.

Learn how Pizarro defeated the Incas, work the problems below.

**ONE,** change the word expressions to symbol statements and locate each answer in the table.

**TWO,** place the letter by the answer in the blank next to the problem.

**THREE,** match the numbers by the picture with the corresponding letters.

1. ___ 5 more than 2
2. ___ 3 less than 8
3. ___ greater by 7 than \( x \)
4. ___ 5 more than \( z \)
5. ___ 5 less than \( y \)
6. ___ \( y \) less than 5
7. ___ 3 times \( x \) plus 1
8. ___ sum of \( x \), \( y \), and \( 2x \)
9. ___ \( z \) more than \( y \)
10. ___ one part of 9 is 3, the other part is ___.
11. ___ \( z \) greater than \( x - y \)
12. ___ \( x \) less than \( x - y \)

\[
\begin{align*}
A &= 5 - y \\
B &= x + y + 5 \\
C &= x + 7 \\
D &= x - y - z \\
E &= x - 9 \\
F &= z - x + y \\
G &= 3x + 1 \\
H &= x + y \\
I &= 5 \\
J &= 9 - x \\
K &= 9 - x \\
L &= 6 \\
M &= 7 \\
N &= 3x + y \\
O &= -y \\
P &= y - 5 \\
Q &= y - x \\
R &= y - x \\
S &= z + y \\
T &= z + y - 5 \\
U &= x - y \\
V &= y \\
W &= z + 5 \\
Z &= x - y + z
\end{align*}
\]
5-2-11-6-18-18-12 2-8-22-2-15-19-16 15-17-19 14-2-8-7 15-12
17-2-9 3-6-1-5 6-8-16 3-6-5-15-20-18-19-16 17-2-1 2-8 6-8
6-1-13-20-9-17 9-2-8-3-19 6-10-10 5-12-4-19-18 18-19-9-15-19-16
2-8 15-17-19 14-2-8-7, 5-2-11-6-18-18-12 4-12-8
3-12-8-15-18-12-10 12-21 15-17-19 2-8-3-6 8-6-15-2-12-8.

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St. Francis

St. Francis of Assisi (1182-1226) was one of the most remarkable men of all times. In 1206, Francis gave up his wealthy life to devote himself to God by serving the poor. So great was Francis's faith in God that he accepted total poverty, begging his living as he toiled to help the poor. When Francis met a leper, he never ran away. He would stop, embrace the unfortunate victim and give what help he could. Eventually, his life of poverty and charity led to his founding of the Franciscan religious order.

St. Francis strove to imitate the life of Christ. He prayed to know and appreciate completely the sufferings Christ endured on the cross. Learn the unusual way Francis’s prayer was answered by solving the problems below.

ONE, replace each word statement by its equivalent symbol statement located in the table.

TWO, place the letter by the answer in the blank next to the problem.

THREE, match the numbers by the picture with the corresponding letters.

1. __ $x$ greater than 3
2. __ $x$ less than 3
3. __ $x$ less than 3 or $x$ equal to 3
4. __ $x$ greater than or equal to 3
5. __ $x$ greater than $-3$ and less than or equal to 3
6. __ $x$ greater than 3 and less than or equal to $-3$
7. __ $x$ greater than 3 or $x$ less than or equal to 3
8. __ $x$ not equal to 3
9. __ $x$ less than $-2$
10. __ $x$ not less than $-2$
11. __ $x$ not equal to $-2$
12. __ $x$ not greater than $-2$
13. __ $x$ greater than $-2$ and less than 3
14. __ $x$ not greater than $-4$ and not greater than $-5$
15. __ $x$ not greater than $-4$ or not greater than $-5$
16. __ $x$ not less than $-4$
17. __ $x$ not less than nor equal to $-4$.
18. __ $x$ greater than $-2$ and less than 4
19. __ $x$ not greater than 4

A: $x \leq -4$  E: $x \geq -4$  I: $x < -2$  R: $-2 \leq x < 4$  W: $x \leq 4$
B: $x < 3$ or $x \geq 3$  F: $x \geq -2$  L: $x \leq -5$  S: $-2 < x < 3$
C: $x > -4$  G: $x \leq 3$  M: $x \geq 3$  T: $x > 3$
D: $x \in R$  H: $x < -2$ or $x > -2$  N: $x < 3$  U: $x \leq -2$
D: $x \in R$  H: $x < -2$ or $x > -2$  N: $x < 3$  U: $x \leq -2$
D: $x \in R$  H: $x < -2$ or $x > -2$  N: $x < 3$  U: $x \leq -2$

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11-16  18-16-17-16-9-5-16-7  1-11-16  13-1-9-3-4-15-1-15,  1-11-16
8-14-16-16-7-9-2-3  19-6-12-2-7-13  6-10  1-11-16
17-18-12-17-9-10-9-16-7  17-11-18-9-13-1  6-2  11-9-13
11-15-2-7-13,  10-16-16-1  15-2-7  13-9-7-16.
The Sultan’s Treasure

When an ancient Egyptian pharaoh died, his body was sealed into a massive rock tomb with treasures of gold, silver, jewels, and many luxurious possessions to comfort him in the next life. In 2750 B.C., King Cheops built the most impressive tomb, the Great Pyramid, rising 482 ft. It remained sealed until the ninth century when Egypt came under the rule of the Arab Sultan Al Mamoum. The sultan commanded an army of workers to mine their way through 100 ft. of solid rock. They broke into a passageway that led to a great hall and the king’s chamber itself. Al Mamoum was astonished. Learn what the sultan discovered by solving the problems below.

ONE, simplify each expression to find the answer in the table.

TWO, place the letter by the answer in the blank next to the problem.

THREE, match the numbers by the picture with the corresponding letters.

1. __ (8 + 3) - 5
2. __ (8 - 3) + 5
3. __ (9 - 4) - 5
4. __ (12 - 4) - 3
5. __ 12 - (4 - 3)
6. __ \( \left( \frac{3}{4} - \frac{1}{4} \right) - \frac{1}{4} \)
7. __ \( \frac{3}{4} - \left( \frac{1}{4} - \frac{1}{4} \right) \)
8. __ (2.5 - 1) - 0.5
9. __ 2.5 - (1 - 0.5)
10. __ \( \left( \frac{3}{4} \right) \left( \frac{1}{4} \cdot \frac{2}{3} \right) \)
11. __ \( \frac{3}{4} \div \frac{1}{4} \)
12. __ \( \frac{1}{4} \div \frac{3}{4} \)
13. __ \( \left( \frac{3}{5} \cdot \frac{1}{3} \right) \left( 2 \frac{1}{2} \right) \)
14. __ \( 4 \div 2 \div \frac{4}{3} \)
15. __ \( 4 \div \left( 2 \div \frac{4}{3} \right) \)
16. __ (2.8 \times 5) \times 0.5
17. __ (2.4 \div 2) \div 0.3
18. __ 2.4 \div (2 \div 0.3)

A = 11  E = 1  K = 0.36  O = 0  T = \( \frac{1}{2} \)  W = \( \frac{1}{4} \)
B = 3  H = \( \frac{3}{4} \)  M = \( \frac{1}{3} \)  P = 4  U = \( 2 \frac{2}{3} \)  Y = \( \frac{1}{8} \)
C = 7  I = 10  N = \( \frac{1}{2} \)  R = 2  S = 5
D = 6

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13-7-8  13-3-12-11  6-5-4  8-12-17-13-10.  14-3  3-14-8
18-14-3-6-4  6-7-8-9-8  16-7-8-3-17-4  3-9  7-2-4
**The Mayan Bargain**

The ancient Mayan Indians of Mexico brought to the great plazas of their rich cities many goods such as pumpkins, corn, animals, baskets and pottery to be traded. But, of all the products, the cacao bean was the most valuable because Mayans had a great passion for their chocolate drink called *ha*. Other traded goods became valued in cacao beans. For example, a pumpkin was worth 4, a rabbit 10, and a slave 100. To learn why Mayans carefully pressed each bean whenever they traded them, solve the problems below.

**ONE.** use the distributive law to find an equivalent expression and locate the answer in the table.

**TWO.** place the letter by the answer in the blank next to the problem.

**THREE.** match the numbers by the picture with the corresponding letters.

1. __ \(3(4 + 2)\) 12. __ \((2 + 0.5)(4)\)
2. __ \(5\left(3 + \frac{1}{2}\right)\) 13. __ \((3)(4) + (4)(3)\)
3. __ \((3 + 4)(2)\) 14. __ \(7\left(\frac{1}{4}\right) + 7\left(\frac{3}{4}\right)\)
4. __ \(\left(6 + \frac{1}{2}\right)(5)\) 15. __ \(\frac{1}{2}(11 + 13)\)
5. __ \(4(5) + 4(2)\) 16. __ \((0.25)(9 + 3)\)
6. __ \(4(6) + 3(6)\) 17. __ \(\frac{1}{3}(3 + 9)\)
7. __ \(3\left(\frac{1}{2}\right) + 7\left(\frac{1}{2}\right)\) 18. __ \(2(10 + \frac{1}{2})\)
8. __ \(1(2 + 7)\) 19. __ \((4 + 7)(3)\)
9. __ \(3(0.5 + 0.3)\) 20. __ \(8\left(3 + \frac{1}{4}\right)\)
10. __ \(5(1 + 6)\)
11. __ \((3 + 5)(6)\)

\[\begin{aligned}
A &= 3(2) + 4(2) & F &= (3 + 7)(1/2) & M &= 3(4) + 3(2) & T &= 1(2) + 1(7) \\
B &= 48 & G &= 8(3) + 8(1/4) & N &= 3(0.5) + 3(0.3) & U &= 2(10) + 2(1/2) \\
C &= 24 & H &= (4 + 3)(6) & O &= 4 & V &= 5(3) + 5(1/2) \\
D &= 12 & I &= 10 & R &= 35 & W &= 4(3) + 7(3) \\
E &= 6(5) + (1/2)(5) & L &= 7 & S &= 4(5 + 2) & Y &= 3
\end{aligned}\]
La Befana

Italians say that La Befana is a witch who refused to honor the three Magi as they passed her hut on their way to the Christ child. The witch was punished. Ever since, La Befana haunts the Twelfth-night of Christmas looking for the three Magi.

Learn more about the legend of La Befana, by adding the similar terms in the problems below.

**ONE,** simplify each expression to find the answer in the table.

**TWO,** place the letter by the answer in the blank next to the problem.

**THREE,** match the numbers by the picture with the corresponding letters.

1. ___ $6x + 5x + 8x$
2. ___ $x + 7x$
3. ___ $4y + y + 7y$
4. ___ $x + 5 + 3x$
5. ___ $x + y$
6. ___ $x + 3y + 2x + y$
7. ___ $x + 2y + 5x$
8. ___ $x + (-3x)$
9. ___ $-x + (-3x)$
10. ___ $-x + 3x$
11. ___ $-x + 7y + (-y)$
12. ___ $7x + y + 6x + (-y)$
13. ___ $-x + (-y) + x + y$
14. ___ $8 + 6y + 9y$
15. ___ $2x + 6y + 8x + 5y + 4$
16. ___ $x + 2y$
17. ___ $y + y + y$
18. ___ $-x + (-x) + (-3x)$
19. ___ $5x + 6y + 9y + 3x$

A = 2x  
F = -2x  
L = -5x  
R = 15y + 8  
B = x + 2y  
G = -x + 6y  
M = 4x + 5  
S = -4x  
C = 12y  
H = 3x + 4y  
N = 8x + 15y  
T = x + y  
D = 13x  
I = 0  
O = 10x + 11y + 4  
U = 6x + 2y  
E = 19x  
K = 8x  
P = 3y
Wise Owl

Aesop's book, The Fables, has entertained millions of people ever since it was written in the sixth century B.C. In one of his famous stories, the Greek slave told of the owl's wisdom. Apparently, there was a time when the other birds of the forest did not listen to the advice given by the wise one. When the owl said, "eat up the flax seed men plant, for they will make nets to catch you," the proud birds only laughed at him. Soon, however, the birds of the forest saw that the owl's predictions were true. They finally came to respect the owl for his wisdom and asked him how they could protect themselves from men.

Learn what answer the owl gave by simplifying the problems below.

**ONE,** simplify each expression to find the answer in the table.

**TWO,** place the letter by the answer in the blank next to the problem.

**THREE,** match the numbers by the picture with the corresponding letters.

1. ___ sum of: $x$, $2x$, and $3x$
2. ___ add: $x$, $2y$, and $3x$
3. ___ $7x + 4x + 5x$
4. ___ sum of $-x$ and $2x$
5. ___ add: $-y$, $2y$, and $3y$
6. ___ $3y + 9 + y$
7. ___ sum of $x$ and $y$
8. ___ $-x + 3x$
9. ___ $3y + (-2y)$
10. ___ add: $-x$, $7x$, and $3y$
11. ___ sum of: $3x$, $-4x$, and $-5x$
12. ___ $8 + 5y + (-7) + (-y)$
13. ___ $2x + 3x + 4x$
14. ___ sum of: $8$, $5y$, and $14$
15. ___ add: $x$, $2y$, and $3$
16. ___ $8 + 3y + (-4)$
17. ___ add: $0.5x$ and $-x$
18. ___ $7x + 3 + 8x$
19. ___ sum of: $-3.5x$ and $4x$
20. ___ $1.5x + (-3.5x) + x$

$A = 4y$
$B = 5y + 22$
$C = 15x + 3$
$D = y$
$E = 4y + 1$
$F = x + y$
$H = 4x + 2y$
$I = -6x$
$L = 6x$
$M = 4y + 9$
$N = x$
$O = 0.5x$
$P = 6x + 3y$
$R = 2x$
$S = 16x$
$T = -x$
$U = 3y + 4$
$V = -0.5x$
$W = 9x$
$Y = x + 2y + 3$

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12-17-12-8  3-11-4-18-12  20-2-12-4,  2-12  8-12-7-16-3-12-3  20-19
5-9-17-11-3-12  20-2-12-6,  14-16-20  19-4-1-15  3-20-5-8-12-3
11-4-20-19  20-2-12  9-11-3-20-5-4-18-12  5-4-9
8-12-10-12-5-20-3  20-2-12  13-19-8-9  "13-2-19."

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La Llorona

According to Mexican legend, a ghostly woman in white roams the countryside at midnight, chanting into the wind, “Oh, my children, we are lost.” They call her La Llorona. Some say she is a vampire feeding on men. Others claim she is an Aztec goddess searching for her lost children.

One tale of the woman involves two men who followed her to the edge of their town. They called to her. She turned around. She was a frightful sight. La Llorona’s eyes squirmed with living snakes; her head was like that of a horse; her fingernails were shiny like tin. When the woman let out a shriek, the men fled in terror.

Many Mexicans say that La Llorona is the ghost of a famous woman. To learn who that woman was, work the problems below.

**ONE,** simplify each expression to find the answer in the table.

**TWO,** place the letter by the answer in the blank next to the problem.

**THREE,** match the numbers by the picture with the corresponding letters.

1. __ $3a + 2a$  
2. __ $-3a + 7a$  
3. __ $-a + 3a - 2a$  
4. __ $3(3a - 4a)$  
5. __ $b(9a - 3a)$  
6. __ $(2a - 5ab)$  
7. __ $6a + 2ax$  
8. __ $18ax - 4ax$  
9. __ $4ax - 2ax + 3ax$  
10. __ $4a(x - 3a)$  
11. __ $4(a - 2b) - 2(2a + b)$  
12. __ $2ab - 3ab - 7ab + ab$  
13. __ $5b - 7 + 3b + 5$  
14. __ $2ab - 2ab^2 - 2ab$  
15. __ $2ax^2 + 10ax^2$  
16. __ $-3ax^2 - 5ax^2$  
17. __ $6ax^2 - 5ax^2$  
18. __ $5ax^2 - 6ax^2$  
19. __ $-4ab + 4ab - 4a$  
20. __ $2b(-5a + 2a)$  
21. __ $-4a(5x - 3x) - 5a(3x - 7x)$  
22. __ $6a^2 - 3ax^2 + 4ax - 3ax^2$

| A = 4a | E = 0 | I = 5ax | N = 14ax | S = 6ab | Y = -6ab |
| B = -2ab² | F = -4a | K = -8ax | O = 8ax | T = ax² | Z = 8b - 2 |
| C = 8ax² | G = 5a | L = -3a | P = -ax² | V = -7ab |
| D = 4ax | H = -8ax² | M = 12ax | R = -10b | W = -3ab |

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5-16-3  6-2-5  21-2-11-9-8-2,  17-16-3  21-7-17-16-3-11  7-19
2  5-7-8  14-20  15-7-11-17-3-13.  5-16-3  10-9-4-4-3-22
16-3-11-5-3-4-19  2-8-22  17-16-3  14-7-20  17-7  18-11-3-12-3-8-17
16-9-21  19-11-7-21  14-3-9-8-1  17-2-10-3-8
2-6-2-20  17-7  5-18-2-9-8.
Vikings had a tradition of blood brotherhood. Blood brothers were men who had been raised together from youth or who had fought against each other and earned mutual respect for strength or noble character. When Vikings became blood brothers, at a special ceremony, they dug a ring of turf out of the ground and used it to make three arches over the hole. The men stood beneath the arches of earth and cut themselves, allowing the blood to flow into the hole in the ground. Then they swore over a spear point, never to fight against one another and to share whatever they won in battle.

Solve the problems below to learn of a difficult promise blood brothers had to keep.

**ONE.** simplify each expression to find the answer in the table.

**TWO.** place the letter by the answer in the blank next to the problem.

**THREE.** match the numbers by the picture with the corresponding letters.

1. \(3x + 4x - x\)  
2. \((x + 3) + (4x - 7) + (x - 2)\)  
3. \((2x + 2z + 6) + (x - 2y + 3z) + (3x + 2y - 5z)\)  
4. \((x^2 - 2x - 2y) + (-4x + 2y - x^2)\)  
5. \((x^2 + 3x + 5) + (x^2 - 3x + 1)\)  
6. \(x^2 - 3x^2\)  
7. \((3x^2 + 4x) - (x^2 - 2x)\)  
8. \(\text{add } x + 5 \text{ and } x + 1\)  
9. \((x^2 + 3x + 2) - (x^2 + 2x + 2)\)  
10. \(\text{subtract } x + 7 \text{ from } x + 9\)  
11. \(12x^2 \text{ minus } -6x^2\)  
12. \(\text{add } 2x^2 + 3x + 1, x^2 + x - 1, \text{ and } 3x^2 + 2x\)  
13. \(12x^2 \text{ from } -6x^2\)  
14. \(\text{subtract } x + 9 \text{ from } x + 7\)  
15. \(\text{sum of } 12x^2 \text{ and } -6x^2\)  
16. \((6x + 6) + (6x^2 + 3x + 3) + (-3x^2 - 9x)\)  
17. \(\text{subtract } 6x + 6 \text{ from } 0\)  
18. \(3(x + 5) - 2(x + 4)\)  
19. \(-3(x - 1) + 7 + 5(x - 2)\)  
20. \(2(3x - 5y) - 3(2x - 4y) - 2y\)

\[A = 2x^2 + 6x\]  \[F = x + 7\]  \[K = 0\]  \[O = 2x^2 + 6\]  \[U = 6x^2 + 6x\]
\[B = -2\]  \[G = 6x - 6\]  \[L = x\]  \[R = -18x^2\]  \[V = -6x - 6\]
\[D = 2x\]  \[H = 6x^2\]  \[M = 3x^2 + 9\]  \[S = -2x^2\]  \[W = -6x\]
\[E = 6x\]  \[I = 2x + 6\]  \[N = 2\]  \[T = 6x + 6\]  \[Y = 18x^2\]
8-18  7  14-9-5-5-19  14-13-5-3-15-1-13  4-7-6  20-8-9-9-1-19
8-10  14-7-3-3-9-1,  3-15-1  6-12-13-17-8-17-8-10-2
14-13-5-3-15-1-13  4-7-6  3-5  6-9-7-11  3-15-1  16-7-10  4-15-5
3-5-5-20  3-15-1  9-8-18-1.
The Pharos

During the reign of King Ptolemy of Egypt (285-246 B.C.), the greatest lighthouse known to history was built off the coast of Alexandria, Egypt. It was called the Pharos and was one of the seven wonders of the ancient world. The marble structure rose 600 ft. Mules carried fuel up broad ramps that climbed gradually to an observation platform 500 ft. above the ground. When its fire atop blazed in the night, the gigantic mirror cast a blinding beacon of light for 30 miles. The fabulous lighthouse stood until the ninth century. To learn what happened to the Pharos, solve the problems below.

ONE, Use the distributive law to find the expanded form in the table below.
TWO, place the letter by the answer in the blank next to the problem.
THREE, match the numbers by the picture with the corresponding letters.

1. __ 2a(3a + b) 12. __ ab³(a - b)
2. __ 2a(3a - b) 13. __ (ab)²(a - b)
3. __ -2a(3a + b) 14. __ (- ab)³(a + b)
4. __ -2a(3a - b) 15. __ a(a² + a + b)
5. __ a²b(3a + 2b) 16. __ a(a - b - b²)
6. __ a²b(3a³ - b²) 17. __ (a - b)(ab)
7. __ ab(2a - 3b) 18. __ (a + b)(5a²b)
8. __ -ab(2a - 4a) 19. __ (a - 1)(ab)
9. __ - a³b(a² - ab² + 2ab³) 20. __ (a + b - 1)(ab)
10. __ ab(a³ - 3ab + 5b²) 21. __ (a - b - 1)(-ab)
11. __ - ab³(a² - b²)

A = -6a² - 2ab  G = a⁴b - 3a²b² + 5ab³ N = a²b + ab² - ab  T = a²b³ - ab⁴
B = a²b - ab² H = 6a² - 2ab O = - a³b³ + ab⁵ U = a³ + a² + ab
C = -a⁴b³ - a³b⁴ L = 2a²b P = 5a³b + 5a²b² V = 3a³b + 2a²b²
D = a²b - ab R = -a²b + ab² + ab W = 3a⁵b - a²b³
E = 6a² + 2ab S = -a⁵b + a⁴b³ - 2a⁴b⁴ Y = a² - ab - ab²
F = 2a²b - 3ab² M = -6a² + 2ab
Junipero Serra

Padre Junipero Serra was the Spanish missionary who founded the first nine of the 21 California missions.

In 1769, Padre Serra established his first mission at San Diego. After the mission was founded, Gaspar de Portola, a leader of the Spanish troops, advised the Padre that it may have to be abandoned. He feared their supply ship would not meet them. Padre Serra asked Portola to wait for nine days. Padre Serra called upon his men to make a novena of nine days of prayer for the ship's arrival. On the ninth day, the supply ship San Antonio, was sighted but sailed on.

Solve the problems below to learn how the first California mission was saved.

**ONE,** multiply the binomials to find the answer in the table.

**TWO,** place the letter by the answer in the blank next to the problem.

**THREE,** match the numbers by the picture with the corresponding letters.

1. ___ $(a + 5)(a + 2)$
2. ___ $(a + 2)(a + 2)$
3. ___ $(a + 1)^2$
4. ___ $(a - 5)(a + 2)$
5. ___ $(a + 5)(a - 2)$
6. ___ $(a - 5)(a - 2)$
7. ___ $(a - 2)^2$
8. ___ $(a - 3)^2$

9. ___ $(a + 3)^2$
10. ___ $(a + b)(a - b)$
11. ___ $(b + a)(b - a)$
12. ___ $(a + 2)(b + 5)$
13. ___ $(a - 3)(a + 2)$
14. ___ $(a + 3)(a - 2)$
15. ___ $(a - 3)(a - 2)$

$$
A = a^2 + 4a + 4 \quad E = a^2 - 4a + 4 \quad K = a^2 + a - 6 \quad R = ab + 5a + 2b
B = a^2 - b^2 \quad G = a^2 - a - 6 \quad L = a^2 + 6a + 9 \quad + 10
C = b^2 - a^2 \quad H = a^2 - 5a + 6 \quad N = a^2 + 3a - 10 \quad S = a^2 + 2a + 1
D = a^2 - 6a + 9 \quad I = a^2 - 3a - 10 \quad O = a^2 + 7a + 10 \quad T = a^2 - 7a + 10
$$

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The Watusi (Watutsi or Batutsi) tribe of East Africa was known for its magnificent dancers. Watusi dancers were often more than 7 feet tall and wore costumes that trace their heritage back to ancient Egypt. Around their waist was a red and white cotton garment. Their beaded headdress held a long sweeping mane of white monkey hair. Around their ankles, the dancers tied shimmering bells and streamers of white monkey hair. The Watusi thrusted very long and sometimes unusually shaped spears about during a dance which was beautiful, crashing and violent.

To learn more about the Watusi, solve the problems below.

**ONE,** simplify each expression or complete the missing factor to find the answer in the table.

**TWO,** place the letter by the answer in the blank next to the problem.

**THREE,** match the numbers by the picture with the corresponding letters.

1. \( (a^5)(?^7) = a^7 \)
2. \( (-a^2)(?) = a^4 \)
3. \( (?)a^4(a) = a^8 \)
4. \( a^3(?)a^{12} = 0 \)
5. \( (?)(3ab^2) = -3ab^3 \)
6. \( (?)^2(ab) = a^3b^3 \)
7. \( (-3a)(?)b = -3ab^2 \)
8. \( (-2a)^2(?) = 12a^3b \)
9. \( (?)(-3a^2b^2)^2 = 18a^5b^5 \)
10. \( (-a)^3(?) = a^3b \)

11. \( (-3ab)(2ab)(?) = 18a^5b^4 \)
12. \( (-ab)^3(?) = a^4b^4 \)
13. \( (-3a)(?)^3 = 81a^4 \)
14. \( (5a^3b^4)(?) = 30a^6b^5 \)
15. \( (?)(3a^4b^6) = -27a^5b^8 \)
16. \( (a^2b^3)(a^4) = (?) \)
17. \( (ab)(ab)^2(-a) = (?) \)
18. \( (-a)^3(-b)^2(ab)^2 = (?) \)
19. \( -a^2(?)(a^5b^5)(a^3b^3) = a^{12}b^4 \)

A = 2ab \hspace{1cm} G = -a \hspace{1cm} K = -b \hspace{1cm} O = -ab \hspace{1cm} T = -a^4b^3
B = 0 \hspace{1cm} H = a^2 \hspace{1cm} L = -3a^3b^2 \hspace{1cm} P = a^6b^3 \hspace{1cm} U = -3a
D = -a^2 \hspace{1cm} I = -3b \hspace{1cm} M = ab \hspace{1cm} R = 3ab \hspace{1cm} Y = -a^5b^4
E = b^2 \hspace{1cm} J = -9ab^2 \hspace{1cm} N = a \hspace{1cm} S = 6a^3b

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ST. VALENTINE

In the late Middle Ages, the custom of sending notes of affection on February 14, the feast of St. Valentine began. Perhaps, it was in imitation of the saint who risked his life to encourage his fellow Christians not to give up their faith in Jesus Christ.

St. Valentine lived in Rome during the 3rd century A.D. At that time it was against the law to be a Christian – the penalty was death. However, if a person was accused of being a Christian, he could escape the sentence by showing his loyalty to the state by offering incense to the statue of the emperor, acknowledging the belief in the divinity of the emperor. This was impossible for a Christian. Valentine encouraged his fellow Christians to face the most cruel death of being crucified, burnt to death, or eaten by lions, rather than acknowledging the emperor as a god. Valentine was apprehended in 269 A.D. under emperor Claudius the Goth. Since he was a Roman citizen, his penalty was to be beaten with clubs and beheaded. He was martyred on the Flaminian Way about two miles outside of Rome on February 14.

Learn more about Valentine by multiplying the binomials in the problems that follow.

**ONE,**
multiply the binomials in each problem and find the answer in the table below.

**TWO,**
place the letter by the answer in the blank next to the problem.

**THREE,**
match the numbers by the picture with the corresponding letters.

1. ____ $(x + 4)(x + 1)$
2. ____ $(x - 4)(x - 1)$
3. ____ $(x - 4)(x + 1)$
4. ____ $(x + 4)(x - 1)$
5. ____ $(x - 1)^2$
6. ____ $(x + 1)^2$
7. ____ $(x + 4)^2$
8. ____ $(x - 4)^2$
9. ____ $(4x + 1)(x + 1)$
10. ____ $(x - 1)(x + 1)$
11. ____ $(4x - 1)(x - 1)$
12. ____ $(2x + 1)^2$
13. ____ $(2x - 1)^2$
14. ____ $(2x + 1)(2x - 3)$
15. ____ $(2x - 1)(2x + 3)$
16. ____ $(2x - 1)(2x - 3)$
17. ____ $(2x + 1)(2x + 3)$
18. ____ $(2x - 3)^2$
19. ____ $(2x + 3)^2$
20. ____ $(2x + 3)(2x - 3)$

A = $x^2 - 3x - 4$  
B = $x^2 - 8x + 16$  
C = $4x^2 - 4x - 3$  
D = $x^2 - 12x + 9$  
E = $x^2 + 5x + 4$

G = $x^2 + 2x + 1$  
H = $4x^2 - 5x + 1$  
I = $4x^2 - 8x + 3$  
J = $4x^2 + 8x + 3$  
L = $x^2 - 5x + 4$

N = $x^2 - 2x + 1$  
O = $4x^2 + 3x - 1$  
P = $4x^2 + 4x - 3$  
Q = $4x^2 + 12x + 9$  
R = $x^2 + 3x - 4$

T = $4x^2 - 9$  
U = $x^2 + 8x + 16$  
V = $4x^2 + 4x + 1$  
W = $4x^2 + 5x + 1$  
S = $4x^2 - 4x + 1$
LEgend of the Sphinx

For more than 4,500 years, a gigantic statue of a lion with the head of the pharaoh Khafre has guarded the ancient pyramids of Egypt. The Sphinx, as it was named by the ancient Greeks, measured 73 meters long and 20 meters high.

The awesome limestone colossus bears a legend. A very tired young prince traveling through the desert decided to rest beneath the shade of the ancient Sphinx. Soon the young man was fast asleep. He had a fantastic dream in which the Sphinx promised him a great reward, if he would clear the sand that had piled up about the great monument. When the prince awoke, he ordered workers to remove the sand.

Learn how the prince was rewarded by performing the division in each problem that follows.

**ONE.** simplify each expression to find the answer in the table.

**TWO.** place the letter by the answer in the blank next to the problem.

**THREE.** match the numbers by the picture with the corresponding letters.

1. ___ Divide \( x^8 \) by \( x^3 \)
2. ___ Divide \( x^8y^9 \) by \( x^2y \)
3. ___ \( x^3y^8 \div x^2y^{10} \)
4. ___ \( x^2y^2 + x^3y^5 \)
5. ___ Divide \( \frac{8x^2y}{16x} \)
6. ___ Divide \( \frac{-80x^6y^5}{-20x^2y} \)
7. ___ Quotient of \( \frac{18x^3y}{-6x^2} \)
8. ___ \( \frac{-2x^2y^4}{2x^2y^4} \)
9. ___ Remainder of \( \frac{4x^4}{4x^2} \)
10. ___ Divide \( -x \) by \( -1 \)
11. ___ \( x^4y^7 + (-x^3y^7) \)
12. ___ Divide \( 54x^3y^4 + (-9x^4y^5) \)
13. ___ Quotient of \( \frac{-3x^5y}{9xy^2} \)
14. ___ \( -x^2y^5 + x^3y \)
15. ___ \( 16x^3y^3 + (-64x^4y^4) \)

\[
A = -6/xy \quad E = -y^4/x \quad H = -1/4xy \quad P = -x^4/3y \quad T = 4x^4y^4 \\
B = x^5 \quad F = x \quad M = x^6y^7 \quad R = x/y^2 \quad U = -1 \\
C = xy/2 \quad G = -3xy \quad O = 1/xy^3 \quad S = 0 \quad Y = -x
\]
15-14  1-14-5-12-2-14  6-15-8-6-2-4-9-14
6-15-14  10-4-8-3-6-15,  13-15-12-3-12-4-15
4-10   14-7-11-13-6.
Adventures In Pre-Algebra

Mystery of the Maya

Pok Ta Pok was the popular religious game of the ancient Mayan Indians. Two teams competed on a large I shaped court to control a solid rubber ball or place it through one of the two stone rings mounted high in the surrounding walls.

For protection each player wore a leather helmet and a thick leather glove. Leather hip and elbow pads were used to strike the six inch thick solid rubber ball. In this dangerous game, the hands and feet could not be used to control the ball. Pok Ta Pok required great skill and practice.

To learn the amazing secret of the ball court of the ancient Mayan city of Chichen Itza, perform the division in each of the following problems.

ONE, divide each expression to find the answer in the table.

TWO, place the letter by the answer in the blank next to the problem.

THREE, match the numbers by the picture with the corresponding letters.

1. \[ \frac{20x + 36}{4} \]

2. \[ \frac{15x^2 + 12}{3} \]

3. \[ (5x^2 - 35x) \div 5x \]

4. \[ \frac{39x^3y^2 - 3x^2y^2 + 12xy}{-3xy} \]

5. \[ \frac{14x - 7}{-7} \]

6. \[ \frac{(2x^2y^3 - 4x + 14)}{(-2)} \]

7. \[ \frac{28x^2 - 4xy}{7xy} \]

8. \[ (2x^2 + 7xy - y^3) \div (-1) \]

9. \[ (4x^2 - x) \div (-x) \]

10. \[ 15x^3y^2 \div (-3xy) \]

11. \[ \frac{(81xy - 9xy^2)}{(-3xy)} \]

12. \[ \frac{(49xy^3 - 7x)}{7xy^2} \]

13. \[ \frac{21x^3 - 7x^2 + 14}{7x^2} \]

14. \[ (81x - 9) \div (-9) \]

15. \[ (12x - 54) \div 6 \]

16. \[ (16x^2 + 12x - 8) \div 4x^2 \]

17. \[ (18x^3 + 6x^2 + 36) \div 6x^2 \]

18. \[ (21x^2 - 14x - 28) \div (-7) \]

19. \[ \frac{15x^4y^5 - 35x^3y^2 + 20x^2y^2}{5x^2y^2} \]

20. \[ \frac{-27x^5y^7}{-3x^3y^4} \]

A = -2x + 1
B = -13x^2y + xy - 4
C = 3y - 27
D = 5x + 9
E = 3x^2y^3 - 7x + 4

F = 3x^2 + 2x + 4
H = 5x^2 + 4
I = 3x + 1 + 6/x^2
L = -2x^2 - 7xy + y^2
M = 4xy + 2

N = -9x + 1
O = -5x^2y
P = 3x - 1 + 2/x^2
R = x - 7
S = -2x^2y^3 + 2x - 7

T = 4 + 3/x - 2/x^2
U = 9x^2y^3
V = 2x - 9
W = 7y - 1/y^2
Y = -4x + 1

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5 12-17 6-13 19-3 7-5-1 19-3 5-16 10-14-19 19-14-1 10-18
16-2-19 4-5-8-8 11-10-20-3-16 11-5-14 4-19 2-19-5-3-1
5-12-5-9 5-16 16-2-19 10-16-2-19-3 19-14-1.
The ancient Romans observed a holiday on December 19, about the time of our Christmas. On that day they began seven days of festivities to honor their god, Saturn. During these holidays all business, public or private, was held at a standstill. Schools were closed; executions and military activities were halted; and slaves were temporarily set free and permitted to say whatever they pleased. For hours, citizens sat at tables feasting, drinking and laughing. It was a custom to elect a mock king each day to lead the celebrations.

To learn of another Roman custom during the feasts of Saturnalia, complete the division problems below.

**ONE,** complete each division to find the answer in the table.

**TWO,** place the letter by the answer in the blank next to the problem.

**THREE,** match the numbers by the picture with the corresponding letters.

1. ___ $9 \div (-3)$
2. ___ $-9 \div (-3)$
3. ___ $3a \div (-3)$
4. ___ $-3a \div (-3)$
5. ___ $6a \div (-a)$
6. ___ $12a^2 + 2a$
7. ___ $-2 \div (-\frac{1}{5})$
8. ___ $-3ax \div x$
9. ___ $-3ax \div (-x)$
10. ___ $7a^2x^3 \div (14ax)$
11. ___ $-2a(3x^2)$
12. ___ $-2a(-5)^3 \div (-5)^2x$
13. ___ $-a(x)^2 \div ax^3$
14. ___ $(3ax)^2 \div 4a^3x^3$
15. ___ $-(2ax)^3 \div 2a^2x^5$
16. ___ $(-14ax + 2xa) \div 6x$
17. ___ $-5ax^2(-2a^3)^2 \div xa^4$
18. ___ $(-3a^2 + 6x^5)^0 \div x^2$
19. ___ $(-4ax^2)^3 \div 8a^3$

---

A = a  \hspace{1cm} G = \frac{1}{2}ax^2  \hspace{1cm} M = -2a  \hspace{1cm} T = 6
C = 3a  \hspace{1cm} H = 6a  \hspace{1cm} N = -3a  \hspace{1cm} U = -a
D = -4a/x^2  \hspace{1cm} I = 9/4ax  \hspace{1cm} O = -1/x  \hspace{1cm} X = -8x^6
E = -6  \hspace{1cm} L = -3  \hspace{1cm} R = 3  \hspace{1cm} W = 10/x
F = -20a^3x  \hspace{1cm} S = 1/x^2  \hspace{1cm} Y = -6ax^2

---

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7-6-5  2-13-16-4-8-18  5-19-9-6-4-8-10-5-15
10-14-17-7-18,  3-18-3-4-1-1-11  12-4-19-5-15
Jesse's Loot

There are many tales about the outlaw Jesse James. African Americans from the time of the Old South have handed down one very prized story about a bank robbery in North Carolina. According to the tale, Jesse buried his loot in a graveyard exclusively for Black people – at that time in American history, even cemeteries were segregated. The notorious bandit placed a grave-marker labeled “Dead and Buried” over the spot. Jesse reasoned the money was safe because Black folks were supposed to be afraid of the dead. Little did he know that a Black man was sitting in a tree watching him all the while.

To learn what happened after Jesse left the cemetery, perform the long division problems which follow:

**ONE.** divide each expression to find the answer in the table.

**TWO.** place the letter by the answer in the blank next to the problem.

**THREE.** match the numbers by the picture with the corresponding letters.

1. ___ $(2x^2 + 3x - 20) \div (x + 4)$  
11. ___ $(2x^2 - x - 21) \div (-3 + x)$

2. ___ $(2x^2 + 13x + 20) \div (x + 4)$  
12. ___ $(2x^2 + 15x - 27) \div (3 - x)$

3. ___ $(2x^2 + 13x + 15) \div (x + 5)$  
13. ___ $(4x^2 + 24x + 27) \div (2x + 3)$

4. ___ $(2x^2 - 13x + 15) \div (x - 5)$  
14. ___ $(6x^2 + x - 12) \div (2x + 3)$

5. ___ $(3x^2 - 26x + 35) \div (x - 7)$  
15. ___ $(6x^2 + 17x + 12) \div (2x + 3)$

6. ___ $(3x^2 - 30x + 21) \div (x - 3)$  
16. ___ $(3x^2 + 2x - 21) \div (3x - 7)$

7. ___ $(2x^2 - 17x + 35) \div (x - 5)$  
17. ___ $(3x^2 - 16x + 21) \div (3x - 7)$

8. ___ $(3x^2 - 2x - 21) \div (x - 3)$  
18. ___ $(3x^2 - 8x - 35) \div (3x + 7)$

9. ___ $(3x^2 - 16x - 35) \div (x - 7)$  
19. ___ $(3x^2 + 22x + 35) \div (3x + 7)$

10. ___ $(21 - 9x - 2x^2) \div (x - 3)$

A = $3x - 7$  
B = $3x - 4$  
C = $2x - 5$  
D = $x - 5$

E = $2x + 5$  
G = $3x + 7$  
H = $2x + 9$  
I = $x + 3$

K = $2x + 3$  
L = $2x - 7$  
M = $2x - 9$  
N = $3x + 4$

O = $x - 3$  
P = $2x + 7$  
R = $x + 5$  
S = $2x - 3$

T = $3x - 5$  
U = $3x + 5$  
W = $-2x - 7$
14-2-16-15-8  6-15  17-9-5-7-6-10  6-7-4-17,
13-2  18-9-8  9-11  5-13-2  7-17-17-5  6-15-18
1-13-6-15-8-2-18  5-13-2  12-6-19-3-2-19  5-17  19-2-6-18:
"19-16-4-2-15  6-15-18  8-17-15-2!"
Torn Cloak

According to an ancient Hebrew story, there was a rich old man who gave his entire wealth to his greedy son. Instead of honoring the old man, the greedy son threw him out to beg in the streets. One day, the old man happened to return to his son’s house to beg for a cloak to protect himself from the winter cold. His grandson answered the door and received permission to give the old man a cloak from the attic. But, instead of handing it over, the grandson tore it down the middle and gave him only half. To learn why he gave the old man only half the cloak, complete the long division problems which follow:

**ONE,** simplify each expression to find the answer in the table.

**TWO,** place the letter by the answer in the blank next to the problem.

**THREE,** match the numbers by the picture with the corresponding letters.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>((x^2 + 2x + 6) \div (x - 3))</td>
<td>10.</td>
</tr>
<tr>
<td>2.</td>
<td>((10x^2 + 29x + 14) \div (2x + 3))</td>
<td>11.</td>
</tr>
<tr>
<td>3.</td>
<td>((14x^2 + 19x - 3) \div (2x + 3))</td>
<td>12.</td>
</tr>
<tr>
<td>4.</td>
<td>((x^2 - 8x + 6) \div (x - 3))</td>
<td>13.</td>
</tr>
<tr>
<td>5.</td>
<td>((6x^2 - 13x + 12) \div (2x - 1))</td>
<td>14.</td>
</tr>
<tr>
<td>6.</td>
<td>((6x^2 + 5x - 25) \div (2x + 5))</td>
<td>15.</td>
</tr>
<tr>
<td>7.</td>
<td>((6x^2 - x - 8) \div (2x + 3))</td>
<td>16.</td>
</tr>
<tr>
<td>8.</td>
<td>((6x^2 + 7x - 5) \div (2x - 1))</td>
<td>17.</td>
</tr>
<tr>
<td>9.</td>
<td>((10x^2 - 11x + 8) \div (2x - 1))</td>
<td>18.</td>
</tr>
</tbody>
</table>

\[
A = 3x + 5 \qquad H = x - 7 + \frac{6}{2x-5} \qquad N = -3x + 5 \qquad V = 7x - 1 \\
D = x - 7 + \frac{6}{2x-5} \qquad I = 5x - 3 + \frac{5}{2x-1} \qquad O = 3x - 5 \qquad W = 7x - 3 + \frac{9}{2x+5} \\
E = 3x - 5 + \frac{7}{2x-1} \qquad K = x + 5 + \frac{7}{2x-3} \qquad R = x - 3 + \frac{4}{2x-5} \qquad Y = 3x - 7 + \frac{20}{2x-5} \\
F = x - 5 + \frac{6}{x-3} \qquad L = 5x + 7 + \frac{7}{2x+3} \qquad S = x + 5 + \frac{21}{x-3} \\
G = 5x - 7 \qquad M = 3x - 5 + \frac{7}{2x+3} \qquad T = x - 1
\]
Saint Patrick

For over 1,500 years, the people of Ireland have had a great love for St. Patrick. Perhaps, their great love for him comes from the great love he had for God and the Irish people.

When Patrick was a boy of fifteen, a band of Irish raiders under Noall struck his home in ancient Britain about 401 A.D. They took Patrick and many others back to Ireland where they were sold as slaves. Patrick was forced to tend pigs for six years before escaping. Although not religiously inclined, the boy began to put his trust in God and eventually came to love the Irish people.

After his escape, Patrick studied hard to become a priest. At the age of 45, he was ordained a bishop and sent to Ireland to teach the people about Christ. Before he died in 461 A.D., Ireland was converted to the Catholic faith. St Patrick asked nothing for himself, only to be able to work hard and bring good to the Irish people.

To learn an unusual fact about St. Patrick, simplify the scientific notation problems below.

**ONE.** simplify each expression to find the answer in the table.

**TWO.** place the letter by the answer in the blank next to the problem.

**THREE.** match the numbers by the picture with the corresponding letters.

1. \( \frac{15 \times 10^5}{3 \times 10^4} \)
2. \( \frac{8 \times 10^3}{4 \times 10} \)
3. \( \frac{3.4 \times 10^7}{1.7 \times 10^2} \)
4. \( \frac{8.1 \times 10^2}{9 \times 10} \)
5. \( \frac{4.9 \times 10^8}{7 \times 10^3} \)
6. \( \frac{6.3 \times 10^4}{9 \times 10^2} \)
7. \( \frac{1.8 \times 10^2}{3 \times 10^4} \)
8. \( \frac{1.44 \times 10^6}{1.2 \times 10^4} \)
9. \( \frac{1.21 \times 10^7}{1.1 \times 10^9} \)
10. \( \frac{1.32 \times 10^5}{1.2 \times 10^3} \)
11. \( \frac{5.6 \times 10^2}{8 \times 10} \)
12. \( \frac{72 \times 10^{-1}}{8 \times 10^2} \)
13. \( \frac{2.7}{3 \times 10} \)
14. \( \frac{4 \times 10^2}{3.2 \times 10^4} \)
15. \( \frac{5.6 \times 10^4}{3.2 \times 10^4} \)

A = 200,000  
G = 200  
M = 9  
P = 120  
T = 0.011
C = 50  
H = 70  
N = 1.75  
R = 70,000  
U = 0.009
E = 0.006  
I = 0.0125  
O = 7  
S = 0.09  
W = 110

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Chinese Invention

When the barbarian chief Chih-Yu led his savage army into China in 2634 B.C., Emperor Huang-Ti personally took command of a great force to save his kingdom. Chih-Yu dared not to face the Chinese force directly. Hoping to escape the wrath of China, the barbarians fled north through dense fog that clouded countless miles of uncharted land. Emperor Huang-Ti would not be stopped and guided his army through the dangerous fog using a new Chinese invention. To learn what this Chinese invention was, factor the polynomials which follow:

ONE, factor each polynomial to find the answer in the table.

TWO, place the letter by the answer in the blank next to the problem.

THREE, match the numbers by the picture with the corresponding letters.

1. ___ $2x^2 - 11x + 15$  
10. ___ $15x^2 + 5x + 6x + 2$

2. ___ $2x^2 + 13x + 15$  
11. ___ $2x^2 - 5x - 3$

3. ___ $2x^2 - 7x - 15$  
12. ___ $3x^2 + 8x - 35$

4. ___ $6x^2 + x - 5$  
13. ___ $x^2 - 2x - 35$

5. ___ $6x^2 - 19x - 11$  
14. ___ $3x^3 + 6x^2 + 21x$

6. ___ $6x^2 - x - 2$  
15. ___ $3x^3 - 9x^2 - 60x$

7. ___ $3x(x + 5) + 7(x + 5)$  
16. ___ $256x^2 - 289$

8. ___ $3x^3 + 2x^2 + x + 2$  
17. ___ $9x^2 - 3x$

9. ___ $6x^2 + 4x + 9x + 6$

A = $3x(x^2 + 2x + 7)$  
C = $(16x + 17)(16x - 17)$  
D = $(2x + 3)(3x + 2)$  
E = $(6x - 5)(x + 1)$  
F = $(2x + 1)(3x - 11)$  
H = $(2x + 5)(x + 3)$

I = $(2x + 1)(3x - 2)$  
K = $(x + 5)(3x - 7)$  
L = $3x(x - 5)(x + 4)$  
M = $(3x + 1)(5x + 2)$  
N = $3(x - 1)(x + 1)$  
O = $(x + 5)(x - 7)$

P = $(2x - 5)(x - 3)$  
R = $(x + 5)(3x + 7)$  
S = $(2x + 1)(x - 3)$  
T = $(2x + 3)(x - 5)$  
W = $(x^2 + 1)(x + 2)$

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BLACK MARY

A 6-foot, 200 pound, cigar-smoking, gunslinger, Mary Fields (1832-1914) was one of the toughest pioneers of the old west.

Born into slavery, Mary fled and found help at a Catholic convent in Toledo, Ohio. She became great friends with the nuns. When the sisters moved to Cascade, Montana to open a school for Indian children, Mary remained behind. Not long after, she learned that her friend Mother Amadeus fell seriously ill with pneumonia. Mary made the dangerous journey to help her friend. For eight years Black Mary, as she was sometimes called, helped the nuns build the school. She was always a great friend and protector.

Later, Mother Amadeus helped Mary obtain the job of stage coach driver for the U.S. mail from Cascade. Only one other woman ever held this honor. Mary never missed a day.

Mary was greatly loved and honored by the citizens of Cascade. She received free meals at the hotel; on her birthday the school was closed.

To learn more about Mary, factor the problems below.

**ONE.** factor each polynomial to find the answer in the table.

**TWO.** place the letter by the answer in the blank next to the problem.

**THREE.** match the numbers by the picture with the corresponding letters.

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<tr>
<td>1.</td>
<td></td>
<td>$x^2 - 16$</td>
<td>11.</td>
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<tr>
<td>2.</td>
<td></td>
<td>$x^2 - 25$</td>
<td>12.</td>
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<tr>
<td>3.</td>
<td></td>
<td>$x^2 + 9$</td>
<td>13.</td>
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<tr>
<td>4.</td>
<td></td>
<td>$x^2 - 9$</td>
<td>14.</td>
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<tr>
<td>5.</td>
<td></td>
<td>$4x^2 - 9$</td>
<td>15.</td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td>$x^2 - y^2$</td>
<td>16.</td>
</tr>
<tr>
<td>7.</td>
<td></td>
<td>$64x^2 - 169y^2$</td>
<td>17.</td>
</tr>
<tr>
<td>8.</td>
<td></td>
<td>$4x^2 - 9y^2$</td>
<td>18.</td>
</tr>
<tr>
<td>9.</td>
<td></td>
<td>$1 - 64x^2$</td>
<td>19.</td>
</tr>
<tr>
<td>10.</td>
<td></td>
<td>$49 - 256y^2$</td>
<td></td>
</tr>
</tbody>
</table>

A = $(8x + 13y)(8x - 13y)$  H = $(x + y + 1)(x + y - 1)$  O = $(2x + 3y)(2x - 3y)$  T = $(9x + y)(9x - y)$
B = $(x + y)(x - y)$  I = $(x + 5)(x - 5)$  P = $\left( x + \frac{13}{21} \right) \left( x - \frac{13}{21} \right)$  U = $(4x + 3)(4x - 3)$
D = $(0.1x + y)(0.1x - y)$  L = $(x + y + 1)(x - y - 1)$  R = $(x + 3)(x - 3)$  W = $(2x + 3)(2x - 3)$
E = not factorable  M = $(x + 4)(x - 4)$  S = $(9x + 1)(9x - 1)$  X = $(x + 28)(x - 28)$
F = $(7 + 16y)(7 - 16y)$  N = $(y + x)(y - x)$  Y = $(1 + 8x)(1 - 8x)$

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5-15-3-12  1-7-4-9'-17  15-8-1-3  5-7-17  11-3-17-13-4-8-9-3-11
6-9  10-2-4-3,  13-15-3  13-8-5-12-17-14-3-8-14-16-3
4-3-6-19-2-16-13  2-13  7-13  13-15-3-2-4
8-5-12  3-18-14-3-12-17-3.
STONE MONEY

On the tiny island of Yap, located in the Western Pacific Ocean, the natives used large circular stones for money. Some of the pieces were as large as 9 ft. across and one ft. thick. Whenever the pieces were moved, a long pole was placed through the center of each one so that several men could lift it. Age, quality, color and shape determined the value. A small coin one ft. across was worth about a year’s wages. There were several thousand of these stones on the island. But, there was no hard stone on the tiny coral island.

To learn the mysterious origin of the stone money, factor each of the polynomials below.

ONE, factor each polynomial to find the answer in the table.

TWO, place the letter by the answer in the blank next to the problem.

THREE, match the numbers by the picture with the corresponding letters.

1. __ \(x^2 + 3x + 2\)  11. __ \(x^2 - 1\)
2. __ \(x^2 + 5x + 6\)  12. __ \(x^2 - 6x + 9\)
3. __ \(x^2 - 3x + 2\)  13. __ \(x^2 + 6x + 9\)
4. __ \(x^2 - 5x + 6\)  14. __ \(x^2 - 9\)
5. __ \(x^2 - 5x - 6\)  15. __ \(x^2 - 16\)
6. __ \(x^2 - 3x - 2\)  16. __ \(x^2 + 8x + 16\)
7. __ \(x^2 - x - 2\)  17. __ \(x^2 - 8x + 16\)
8. __ \(x^2 + x - 2\)  18. __ \(x^2 - 6x + 5\)
9. __ \(x^2 - 2x + 1\)  19. __ \(x^2 - 4x - 5\)
10. __ \(x^2 + 2x + 1\)

\[\begin{array}{llllll}
A &=& (x - 2)(x - 1) & F &=& \text{not factorable} & L &=& (x + 2)(x - 1) & P &=& (x + 3)(x - 3) & U &=& (x + 4)^2 \\
C &=& (x + 3)^2 & G &=& (x + 2)(x + 1) & M &=& (x - 2)(x + 1) & R &=& (x + 1)(x - 5) & W &=& (x - 3)^2 \\
D &=& (x + 1)^2 & H &=& (x - 1)(x + 1) & N &=& (x - 1)^2 & S &=& (x - 1)(x - 5) & Y &=& (x - 4)^2 \\
E &=& (x + 3)(x + 2) & I &=& (x - 6)(x + 1) & O &=& (x - 3)(x - 2) & T &=& (x + 4)(x - 4) \\
\end{array}\]

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12-3-19-19-5-4-19-18  5-9  4-16-15-19-5-1-1-2-19  13-3-9-4-2-18
8-4-13-3-15-2-10  11-3-19-10  18-15-4-9-2  4-9  5-18-8-3-9-10-18
11-16-9-10-19-2-10-18  4-6  7-5-8-2-18  3-12-3-17  3-9-10
15-4-12-2-10  5-15  15-4  17-3-14  4-9  19-3-6-15-18.
Crockett's Campaign

When Davy Crockett ran for Congress in 1833, the voters in one crossroad settlement of Tennessee were more interested in drinking rum than hearing about the issues. Davy offered the saloon keeper a racoon skin – the only thing he had to trade. The saloon keeper put the skin under the counter and poured out a bottle of rum for the voters. But, one bottle wasn't enough to please the voters and the saloon keeper's sign read “Pay Today and Trust Tomorrow.”

To learn how Davy interested the voters to listen to him, factor each of the polynomials below.

**ONE,** factor each polynomial to find the answer in the table.

**TWO,** place the letter by the answer in the blank next to the problem.

**THREE,** match the numbers by the picture with the corresponding letters.

<p>| | | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1.</td>
<td>$x^2 + 4x + 3$ &amp; 12.</td>
<td>$3x^2 - x - 10$</td>
</tr>
<tr>
<td>2.</td>
<td>$x^2 - 9$ &amp; 13.</td>
<td>$3x^2 - 11x + 10$</td>
</tr>
<tr>
<td>3.</td>
<td>$x^2 - 6x + 9$ &amp; 14.</td>
<td>$4x^2 + 9x + 5$</td>
</tr>
<tr>
<td>4.</td>
<td>$x^2 + 6x + 9$ &amp; 15.</td>
<td>$4x^2 - x - 5$</td>
</tr>
<tr>
<td>5.</td>
<td>$2x^2 + 3x + 1$ &amp; 16.</td>
<td>$4x^2 + x - 5$</td>
</tr>
<tr>
<td>6.</td>
<td>$2x^2 + x - 1$ &amp; 17.</td>
<td>$4x^2 - 25$</td>
</tr>
<tr>
<td>7.</td>
<td>$2x^2 - x - 1$ &amp; 18.</td>
<td>$x^2 - 12x + 36$</td>
</tr>
<tr>
<td>8.</td>
<td>$2x^2 - 3x + 1$ &amp; 19.</td>
<td>$9x^2 - 30x + 25$</td>
</tr>
<tr>
<td>9.</td>
<td>$x^2 + 8x + 12$ &amp; 20.</td>
<td>$9x^2 + 30x + 25$</td>
</tr>
<tr>
<td>10.</td>
<td>$3x^2 + 11x + 10$ &amp; 21.</td>
<td>$9x^2 - 25$</td>
</tr>
<tr>
<td>11.</td>
<td>$3x^2 + x - 10$ &amp;</td>
<td></td>
</tr>
</tbody>
</table>

$A = (2x + 1)(x + 1)$  $G = (3x + 5)(x - 2)$  $N = (x + 3)(x + 1)$  $V = (3x + 5)^2$
$B = (2x - 1)(x - 1)$  $H = (x + 3)(x - 3)$  $O = (x - 6)^2$  $W = (x - 3)^2$
$C = (3x - 5)(x + 2)$  $I = (4x + 5)(x + 1)$  $R = (x + 6)(x + 2)$  $Y = (3x + 5)(x + 2)$
$D = (4x - 5)(x + 1)$  $K = (x + 3)^2$  $S = (2x - 1)(x + 1)$
$E = (3x - 5)^2$  $L = (4x + 5)(x - 1)$  $T = (2x + 1)(x - 1)$
$F = (3x + 5)(3x - 5)$  $M = (3x - 5)(x - 2)$  $U = (2x + 5)(2x - 5)$

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7-2-19 9-19 3-5-6 5 2-18-16-19 17-1-15-19-9 7-2-19
21-18-9 7-2-19 20-18-7-19-9-6 3-14-7-2 7-2-19 6-5-13-19
9-5-11-18-18-1 6-4-14-1.

Copyright, Lawrence W. Swienciki, Ph.D., 1999
Sir Walter Raleigh commanded great attention at the English court during the sixteenth century. He was a poet, sailor, statesman, historian, explorer, and favorite of Queen Elizabeth. Legend has it that he threw down his cloak so that the queen would not have to step in a puddle of water.

Sir Walter Raleigh was the first to bring tobacco to England. To learn a humorous thing that happened to Raleigh the first time he lit a pipe in his own home, factor the polynomials that follow:

ONE, factor each polynomial to find the answer in the table.
TWO, place the letter by the answer in the blank next to the problem.
THREE, match the numbers by the picture with the corresponding letters.

1. ___ $3x^2 + 9x + 54$
2. ___ $3x^2 - 12$
3. ___ $3x^2 + 12x + 12$
4. ___ $3x^2 - 18x + 24$
5. ___ $3x^2 - 25x + 28$
6. ___ $3x^3 - 9x^2 + 10x$
7. ___ $x(x + 2) + 2(x + 2)$
8. ___ $x^3 - 2x^2 + x - 2$
9. ___ $x^3 - 2x^2 - x + 2$
10. ___ $x^2 - 4x + 4$
11. ___ $3x^3 - 12x$
12. ___ $2x^3 - 12x^2 + 16x$
13. ___ $16 - x^2$
14. ___ $-x^2 + 4x - 4$
15. ___ $27 - 3x^2$
16. ___ $4x^2 + 9$
17. ___ $9 - 4x^2$
18. ___ $4x^2 + 12x + 9$
19. ___ $4x^2 - 12x + 9$

A = $x(x - 2)(2x - 5)$
B = $2x(x - 2)(x - 4)$
C = $3(x - 2)(x - 4)$
D = $-3(x + 3)(x - 3)$
E = $3(x + 2)(x - 2)$
F = $(x - 2)^2$
G = not factorable
H = $(x - 2)(x^2 + 1)$
I = $(2x + 3)^2$
K = $3(x^2 + 3x + 18)$
L = $3(x + 2)^2$
N = $3x(x - 2)(x + 2)$
O = $(2x - 3)(2x + 3)$
R = $(x + 2)^2$
S = $(3x - 4)(x - 7)$
T = $(x + 1)(x - 1)(x - 2)$
U = $-(x - 2)^2$
V = $-(2x + 3)(2x - 3)$
W = $-(x - 4)(x + 4)$

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The Greedy Fishermen

In ancient India, young princes were instructed in fables about animals to teach them wisdom. One such tale concerned two otters who caught a large fish. But, they were greedy fishermen who could not agree on how to divide their catch. When a fox passed, the otters implored him to act as judge. Having experience in such matters, the fox asked the pair some questions, then made his decision. How did the fox divide the fish? To learn the answer, solve the equations below.

**ONE,** solve each equation to find the answer in the table.

**TWO,** place the letter by the answer in the blank next to the problem.

**THREE,** match the numbers by the picture with the corresponding letters.

1. __ $x + 7 = 20$
2. __ $y + 19 = 31$
3. __ $x + 1.5 = 5.9$
4. __ $z + \frac{3}{8} = \frac{5}{8}$
5. __ $y + 7.6 = 13.8$
6. __ $8 + a = 14$
7. __ $3.7 + x = 10$
8. __ $2 \frac{1}{2} + y = 3 \frac{3}{8}$
9. __ $9 = z + 5$
10. __ $15 = a + 4.7$
11. __ $9 \frac{1}{4} = s + \frac{1}{3}$
12. __ $y + 14 = 29$
13. __ $18 = 7 + x$
14. __ $1.3 = 0.5 + w$
15. __ $8 \frac{1}{4} = \frac{2}{3} + x$
16. __ $w + 3.8 = 8.3$

<table>
<thead>
<tr>
<th>A</th>
<th>E</th>
<th>I</th>
<th>O</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\frac{1}{4}$</td>
<td>$\frac{7}{12}$</td>
<td>4</td>
<td>10.3</td>
<td>6.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B</th>
<th>G</th>
<th>L</th>
<th>N</th>
<th>S</th>
</tr>
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<tbody>
<tr>
<td>$\frac{7}{8}$</td>
<td>13</td>
<td>4.4</td>
<td>4.5</td>
<td>15</td>
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2-15  1-4-11-15  5-2-15  2-15-4-13  5-10  10-16-15,
5-2-15  5-4-9-3  5-10  5-2-15  10-5-2-15-6  5-2-15
8-15-12-5  7-4-6-5  2-15  14-15-7-5.
The Singing Duel

The Eskimo Indians of Alaska and Greenland invented an unusual way of ending disputes called a *singing duel*. When a conflict arose between two men, the Eskimo community would gather publicly to settle the matter. The Indians formed a large circular ring about the two opponents who began to sing insults at each other. There was no limit to what the combatants could sing. This often brought great delight to the spectators. To learn how the winner of the singing duel was chosen, solve the problems below.

**ONE,**

solve each equation to find the answer in the table.

**TWO,**

place the letter by the answer in the blank next to the problem.

**THREE,**

match the numbers by the picture with the corresponding letters.

1. ___ $3x = 6$
2. ___ $2y = 14$
3. ___ $3z = 18$
4. ___ $15x = 45$
5. ___ $\frac{1}{2}x = 10$
6. ___ $1.5y = 22.5$
7. ___ $11z = 132$
8. ___ $\frac{3}{5}a = 15$
9. ___ $18x = 378$
10. ___ $0.5z = 4$
11. ___ $4.1x = 36.9$
12. ___ $\frac{1}{6}y = 6$
13. ___ $0.2a = 7$
14. ___ $35x = 175$
15. ___ $6y = 0.72$
16. ___ $\frac{5}{3}z = 0.3$
17. ___ $\frac{7}{8}a = 0.7$
18. ___ $\frac{4}{9}y = 3.6$

A = 6     D = 0.8      H = 2     N = 8.1    R = 3     U = 9
B = 25    E = 0.12     I = 20    O = 5      S = 35    W = 12
C = 36    G = 15       L = 7     P = 0.18   T = 21    Y = 8
12-4-14-7-17  13-5-17-15-17  3-18-17  9-1-15  2-14-13-15-4
16-11-8-2-5-12-2-10  17-5-13-6-4-3-12-15-17.
Queen of the East

Upon the Arabian deserts, Zenobia led her armies to victory over Roman legions. She rebelled and called herself the “Queen of the East.” By 270 A.D., Zenobia ruled half of Rome’s eastern empire from her beautiful city of Palmyra. But, the beautiful warrior queen could not long remain a rebel against Rome. The full strength of the Roman empire was pitted against Zenobia. Palmyra was left a smoking ruin and one of history’s most remarkable women was carried off a prisoner to Rome. Today, a small Arab village lies outside the ruins of Palmyra (located in modern Syria). To learn an unusual custom of the people living there, solve the equations which follow:

ONE, solve each equation for the variable to find the answer in the table.

TWO, place the letter by the answer in the blank next to the problem.

THREE, match the numbers by the picture with the corresponding letters.

1. __ \( x + 5 = 35 \)  12. __ \( 0.5 + x = 2.5 \)
2. __ \( 12 = y = 15 \)  13. __ \( 0.5x = 2.5 \)
3. __ \( w + 17 = 41 \)  14. __ \( z + 5.3 = 40 \)
4. __ \( 38 = x + 15 \)  15. __ \( 5.3z = 641.3 \)
5. __ \( y + 14 = 29 \)  16. __ \( \frac{1}{2} + w = 8 \frac{1}{2} \)
6. __ \( 4x = 56 \)  17. __ \( \frac{1}{2} w = 41 \)
7. __ \( 4 + x = 25 \)  18. __ \( \frac{3}{4} k = 12 \)
8. __ \( y + 13 = 32 \)  19. __ \( k + \frac{3}{4} = 12 \frac{1}{4} \)
9. __ \( 13y = 91 \)  20. __ \( 0.3w = 0.12 \)
10. __ \( 16w = 144 \)  21. __ \( 2.4x = 40.8 \)
11. __ \( w + 16 = 56 \)  22. __ \( 7.5k = 202.5 \)

A = 121    E = 19    I = 14    N = 23    S = 30    Y = 5
B = 82    F = 16    K = 3    O = 40    T = 34.7    Z = 0.4
C = 11.5    G = 24    L = 2    P = 21    U = 8
D = 17    H = 9    M = 15    R = 7    V = 27

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TATAMONA

The people of Guam Island say that a mysterious ghost woman dwells in the dense jungles surrounding the Maina bridge. She is called Tatamona and may appear to travelers crossing the bridge late at night. She comes as a beautiful woman in white often terrifying the travelers. Custom requires that travelers crossing the bridge by car turn the headlights off for their protection. If Tatamona is angered, she may shake the car or even knock it off the bridge. To learn what happens to those travelers to whom Tatamona speaks, solve the equations below.

ONE, solve each equation to find the answer in the table.
TWO, place the letter by the answer in the blank next to the problem.
THREE, match the numbers by the picture with the corresponding letters.

1. ___ \( x + 8 = 17 \)
2. ___ \( 9 + x = 23 \)
3. ___ \( y + 7 = 5 \)
4. ___ \( 12 + w = 6 \)
5. ___ \( x - 3 = 12 \)
6. ___ \( w - 8 = 5 \)
7. ___ \( y - 9 = -3 \)
8. ___ \( x - 7 = -18 \)
9. ___ \( -5 + w = -19 \)
10. ___ \( -12 = z - 5 \)
11. ___ \( -0.05 = z + 0.03 \)
12. ___ \( 1.01 = x + 0.99 \)
13. ___ \( 9 = 8.3 + z \)
14. ___ \( x - 18 = 0 \)
15. ___ \( 1.5 + x = -8.6 \)
16. ___ \( -0.4 = 0.3 + w \)
17. ___ \( -1.1 + y = -8 \)
18. ___ \( w - 3.3 = 3.6 \)
19. ___ \( z + 5.7 = -2.3 \)
20. ___ \( 14.7 + y = 13.9 \)

A = -6, F = 6.9, K = 9, O = 14, T = -6.9
B = -14, G = 13, L = -0.7, P = 15, U = -7
C = -0.08, H = -8, M = -2, R = -11, V = 6
E = 0.7, I = -10.1, N = -0.8, S = 0.02, Y = 18

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Advice from a Fish

According to an ancient Chinese story teller, a cunning fox once eyed a fish darting back and forth in a stream and asked him why he did not swim in one direction or the other. The fish answered that there was a dangerous waterfall downstream and a fisherman with a net upstream. The hungry fox thinking the fish to be rather dull suggested to the fish that he could avoid both dangers by jumping onto the river bank. The fish was not as dull as the fox thought but gave the fox some advice. To learn what the advice was, solve the equations which follow:

ONE, solve each equation to find the solution set in the table.

TWO, place the letter by the answer in the blank next to the problem.

THREE, match the numbers by the picture with the corresponding letters.

1. __ \( x + 5 = 0 \)
2. __ \( (x - 1)(x + 1) = 0 \)
3. __ \( (x - 5)^2 = 0 \)
4. __ \( x(x - 2) = 0 \)
5. __ \( 2x(x + 2) = 0 \)
6. __ \( x^2 - 25 = 0 \)
7. __ \( x^2 + x - 2 = 0 \)
8. __ \( x^2 - 3x - 10 = 0 \)
9. __ \( x^2 + 7x + 10 = 0 \)
10. __ \( x(x + 1)(x - 1) = 0 \)
11. __ \( x(x + 1)^2 = 0 \)
12. __ \( 4x^2 - 16 = 0 \)
13. __ \( 3x^2 - 27 = 0 \)
14. __ \( x^2 + 16 = 0 \)
15. __ \( 5x(x^2 - 2x - 8) = 0 \)
16. __ \( 4x(x^2 - 16) = 0 \)

\[ A = \{ -2, 1 \} \] \[ G = \{ -2, 5 \} \] \[ M = \{ -3, 3 \} \] \[ R = \{ -1, 0 \} \]
\[ D = \emptyset \] \[ H = \{ 0, 2 \} \] \[ N = \{ -1, 1 \} \] \[ T = \{ -2, 0 \} \]
\[ E = \{ -4, 0, 4 \} \] \[ I = \{ 5 \} \] \[ O = \{ -2, 2 \} \] \[ U = \{ -5, 5 \} \]
\[ F = \{ -2, 0, 4 \} \] \[ J = \{ -1, 0, 1 \} \] \[ P = \{ -2, -5 \} \] \[ Y = \{ -5 \} \]
EVE OF SAMHAIN

Halloween began with the Druids at least 2,000 years ago. The Druidic year ended October 31, the Eve of Samhain, a time important to the druids because it marked the ending of summer and celebrated the festival of the dead.

Halloween is a word that came later with Christianity. Irish Catholics rejected the Druids worshipping of the dead. They sought to honor the dead who followed Christ faithfully. They tried to clarify the Christian understanding of honoring the dead by establishing November 1 as a religious day of celebration. Later, Pope Gregory III (731-741) and several of the popes after him declared November 1, All Saints Day, a day to honor the dead throughout the Christian world.

In Europe during the Middle Ages, small numbers of Druids and their followers formed cults that practiced witchcraft and worshipped Satan. Halloween became the night of the Witch's Sabbath for them.

To learn what the early Druids said about Samhain, solve the equations below.

ONE, solve each of the equations to find the answer in the table.

TWO, place the letter by the answer in the blank next to the problem.

THREE, match the numbers by the picture with the corresponding letters.

1. ___ $s - 4 = 7$
2. ___ $2x = x + 5$
3. ___ $3y = -2y + 10$
4. ___ $t + 4 = 7$
5. ___ $-a = 2a + 6$
6. ___ $2b + 3 = -9$
7. ___ $r - 4 = -7$
8. ___ $-4h = 16$
9. ___ $-a - 3 + 4a = 7 + 5a$

10. ___ $3(x - 5) = x + 5$
11. ___ $a + 4 = -7$
12. ___ $r - 4 = 3r - 16 - r$
13. ___ $3z - 5 = 4z + 5$
14. ___ $-7(y - 4) = -y - 26$
15. ___ $-3y = -12$
16. ___ $12v - 6 = 3(v + 4) + 54$
17. ___ $5w + 4 - 12w + 49 = 4$
18. ___ $7x + 28 = -14x - 119$

A = 11  F = 8  L = -11  P = -10  U = 9
C = -6  G = -2  M = 7  R = 5  W = 10
D = -4  H = -3  N = -5  S = -7
E = 12  I = 3  O = 2  T = 4

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3-9  15-7-1-15  9-4-5-7-15,  18-13-4-2-4-15-18  3-16
15-7-12  8-12-1-8  18-3-14-5-7-15  1  13-11-1-6-12
3-16  10-1-2-17-15-7  16-3-2  15-7-12  10-4-9-15-12-2.
The Aztecs had two calendars, the sacred and the solar. The sacred had 20 months of 13 days each, making a total of 260 days. The solar calendar had 18 months of 20 days each, making a total of 360 days. Both calendars were used together in a cycle of 52 years. Five days were added to the solar calendar to make a calendar like ours. The Aztecs called these extra days *nemontemi*, or empty days, and considered them unlucky. Solve the equations below to discover what happened during the five empty days.

**ONE,** solve each equation to find the answer in the table.

**TWO,** place the letter by the answer in the blank next to the problem.

**THREE,** match the numbers by the picture with the corresponding letters.

1. \[ \_ \quad a + 3 = 2 \]
2. \[ \_ \quad r + 3 = 8 \]
3. \[ \_ \quad 2 + m = -1 \]
4. \[ \_ \quad 7 + 2y = 3 \]
5. \[ \_ \quad 3 - 3b = 0 \]
6. \[ \_ \quad 3x - 5 = -5 \]
7. \[ \_ \quad 1.5a + 4 = -3.5 \]
8. \[ \_ \quad 3m - 7 = -5 \]
9. \[ \_ \quad 8 + 4y = -2 \]
10. \[ \_ \quad 2a = 8 \]

\[ A = -2 \frac{1}{2} \quad F = 4 \quad N = -7 \quad S = 1 \quad Y = -\frac{2}{3} \]

\[ H = -2 \quad O = 9 \quad T = -5 \]

\[ C = \frac{2}{3} \quad I = -6 \quad P = -\frac{3}{10} \quad U = 0 \quad Z = -\frac{1}{5} \]

\[ D = -9 \quad L = 2 \quad R = -3 \quad W = 5 \]

\[ E = -1 \quad M = -4 \]

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Hernan Cortés

Hernán Cortés was a Spanish conquistador. He was tough, a product of a country that just won its freedom after fighting eight centuries of bitter religious wars with the invading Moslems of North Africa. He came to the New World to seek his fortune. Cortés was many things: truly brave, religious, resourceful, clever, ambitious, and determined in purpose.

The conquest of Mexico by Cortés is a remarkable story. After establishing a base at Vera Cruz, Mexico, Cortés and 450 Spanish soldiers marched on a 250 mile journey to Mexico City in the year 1519. Within two years, under unbelievable obstacles and hardships, Cortés destroyed the Aztec empire.

Cortés had many Indian allies who hated the Aztecs for brutally sacrificing their women and children to a host of blood-thirsty gods. However, there was a mysterious Aztec legend that helped Cortés. Discover the amazing legend by solving the equations that follow.

ONE, simplify each expression to find the answer in the table.

TWO, place the letter by the answer in the blank next to the problem.

THREE, match the numbers by the picture with the corresponding letters.

1. ___ $3x + 4 = 25$
2. ___ $3y = 25 - 2y$
3. ___ $14x + 5 = -9$
4. ___ $y - 4 = 2y + 7$
5. ___ $5x + 7 = 4x - 23$
6. ___ $13z - 4 = 12z + 15$
7. ___ $5 + x = x + 7$
8. ___ $11z + 3 = 2z - 24$
9. ___ $4(y + 5) = 20 + 4y$
10. ___ $3 + x = 2 + 11x$
11. ___ $5y - 9 = 8y + 7$
12. ___ $3(x + 5) + 4(x + 5) = 21$

13. ___ $6 - (3y + 5) = -(y - 6) + 15$
14. ___ $-9 - 4z = 4z - 15$
15. ___ $-2x - 15 = 6x + 25$
16. ___ $8y - 5(y - 3) = 18y - 6(3y + 1)$
17. ___ $6x + 3 = 3x + 4$
18. ___ $17y - 15 = 11y - 9$
19. ___ $-2x - 3 = -11x + 24$
20. ___ $4 + 10z = 5z + 14$
21. ___ $8x - 11 - (-15 - x) = 0$
22. ___ $-3(2y - 5) - 10y = 6y - 2(5y - 4)$

A = 1/10  F = 7  M = - 4/9  S = 5  W = - 16/3
B = 19  G = 7/12  N = φ  T = 3  Y = 3/4
C = - 1  H = - 11  O = - 10  U = x ∈ R  Z = - 7
D = - 5  I = - 2  Q = - 3  V = 1
E = 2  L = - 30  R = 1/3

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Dr. Faust

According to legend, the aging physician Doctor Faust secluded himself in a mysterious laboratory, searching the ancient books of magic for a formula to restore his youth. One night, the devil promised to make him young again in exchange for his immortal soul. Doctor Faust agreed and soon became a rich young man traveling about 16th century Germany. But, in 1525, one late evening, the devil collected his payment. He tore Doctor Faust from his bed and dragged him into the fiery pits of hell.

The legend of Doctor Faust is based upon a man who actually lived in Germany during the 16th century. To learn more about this mysterious man, solve the following inequalities:

ONE,       solve each inequality to find the answer in the table.
TWO,       place the letter by the answer in the blank next to the problem.
THREE,     match the numbers by the picture with the corresponding letters.

1.  __  \( x + 3 < 4 \)       11.  __  \( -2x + 3 < 5 \)
2.  __  \( x - 3 < 4 \)       12.  __  \( -3x + 4 > 10 \)
3.  __  \( 2x - 4 > 10 \)      13.  __  \( -5x < 20 \)
4.  __  \( 2x + 4 > 10 \)      14.  __  \( 15 < 3x \)
5.  __  \( 3x + 8 < 5 \)       15.  __  \( 15 > -3x \)
6.  __  \( 3x - 10 < 5 \)      16.  __  \( 15 < -3x \)
7.  __  \( 3x + 2x < 15 \)     17.  __  \( 2x - 5x > 9 \)
8.  __  \( -3x + 8x > 20 \)    18.  __  \( -3x - 4x < 49 \)
9.  __  \( -x > 4 \)          19.  __  \( -5x + 3x + 8 < -10 \)
10. __  \( -x + 4 > 0 \)       20. __  \( -x - 2x > 27 \)

\( A = x > 4 \)     \( F = x > -4 \)     \( L = x < -5 \)     \( P = x < 7 \)     \( U = x < -1 \)
\( C = x < -4 \)     \( G = x < 1 \)     \( M = x < -9 \)     \( R = x < -3 \)     \( W = x > -1 \)
\( D = x < 4 \)     \( H = x > 5 \)     \( N = x > -7 \)     \( S = x > 7 \)     \( X = x < 3 \)
\( E = x < -2 \)     \( I = x < 5 \)     \( O = x > 9 \)     \( T = x > -5 \)     \( Z = x > 3 \)

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