Section 1.1

Pythagorean Theorem: For a right triangle with hypotenuse of length c and sides of length a and b, you have $a^2 + b^2 = c^2$.

Distance Formula: The distance d between the points (x_1, y_1) and (x_2, y_2) in the plane is

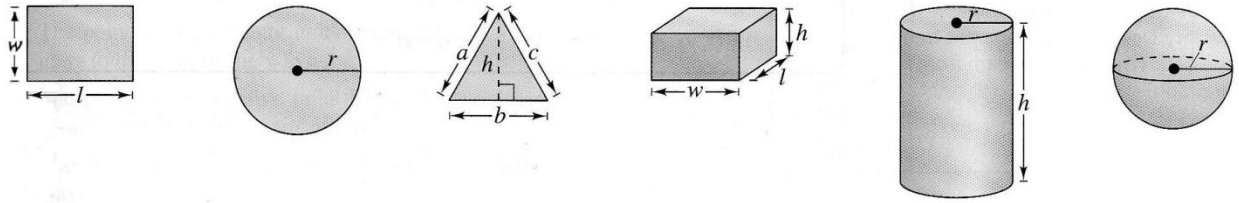
$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}.$$

Midpoint Formula: The midpoint of a line segment joining the points (x_1, y_1) and (x_2, y_2) is given by the Midpoint Formula:

$$\text{Midpoint} = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right).$$

Common Formulas for Area A, Perimeter P, Circumference C, and Volume V

Rectangle	*Circle*	*Triangle*	*Rectangular Solid*	*Circular Cylinder*	*Sphere*
$A = lw$	$A = \pi r^2$	$A = \frac{1}{2}bh$	$V = lwh$	$V = \pi r^2 h$	$V = \frac{4}{3}\pi r^3$
$P = 2l + 2w$	$C = 2\pi r$	$P = a + b + c$			



Problems

Problem 1. Plot the points in the Cartesian plane. $A(3, 1)$, $B\left(\frac{3}{4}, -3\right)$, $C(-3, 4)$, $D\left(-\frac{4}{3}, -\frac{3}{2}\right)$.

Problem 2. Determine the quadrant(s) in which (x, y) is located so that the condition(s) is (are) satisfied.

a) $x > 4$

b) $x > 2$ and $y = 3$

c) $xy < 0$

Problem 3. Show that the points form the vertices of the indicated polygon.

a) Right Triangle: $(1, 5),\ (1, -2),\ (5, -2)$

b) Isosceles Triangle: $(1, -3),\ (3, 2),\ (-2, 4)$

Problem 4. Find the midpoint of the line segment joining the points $(1, 12)$, $(6, 0)$.

Problem 5. Find the coordinates of the endpoint of a line segment if the coordinates of the other endpoint and midpoint are, respectively, $(1, -2), (4, -1)$.

Problem 6. The polygon with original coordinates of vertices $(-3, 6), (-5, 3), (-3, 0), (-1, 3)$ is shifted down by 3 units and shifted to the left by 6 units. Find the coordinates of the vertices of the polygon in its new position.

Problem 7. The diameter of a cylindrical propane gas tank is 4 feet. The total volume of the tank is 603.2 cubic feet. Find the length of the tank.

Homework for this section: Read section 1.1. Watch any videos (marked with  in the e-book)

Also, do the tutorials (marked with  in the e-book).

Do the following problems in preparation for the quiz: #5, 7, 9, 15, 19, 23, 27, 33, 39, 43