

1.1 Rectangular Coordinates

Pythagorean Theorem

Used for right triangles ONLY

$$a^2 + b^2 = c^2$$

Distance Formula

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

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

Midpoint Formula

The midpoint of a line segment with endpoints (x_1, y_1) and (x_2, y_2) is

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

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

Rectangle

$$A = lw$$

$$P = 2l + 2w$$



Circle

$$A = \pi r^2$$

$$C = 2\pi r$$



Triangle

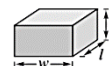
$$A = \frac{1}{2}bh$$

$$P = a + b + c$$



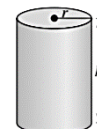
Rectangular Solid

$$V = lwh$$



Circular Cylinder

$$V = \pi r^2 h$$



Sphere

$$V = \frac{4}{3}\pi r^3$$



Examples:

a) Non-graphically, show that the given points are vertices of a right triangle.

b) Non-graphically, find the midpoint of the line segment joining the points

c.) Non-graphically, find the distance between the points

- d.) The quarterback of a football team threw a pass from the 28-yard line, 40 yards from the sideline. The pass was caught by a wide receiver on the 5-yard line, 20 yards from the same sideline. How long was the pass? (drawing a picture could help!)
- e.) Penelec Corporation had annual revenues of \$20.6 billion in 2002 and \$24.7 billion in 2004. Without knowing any additional information, what would you estimate that the 2003 revenue would be? (Assuming the revenue follows a linear pattern)
- f.) A cylindrical can has a volume of 200 cubic centimeters and a radius of 4 centimeters. Find the height of the can.