

- Warm Up:**
1. Write an equation of the line that passes through the point (1, 7) and has a slope of  $-4$ .
  2. Solve the system
 
$$3x + 2y = 3$$

$$4x + 6y = 14$$
 using any algebraic method.
  3. Graph  $y = x^2 - 4x - 12$ . Label the vertex and axis of symmetry.
  4. Solve  $x^2 + 6x - 3 = 0$  by completing the square.

## Quadratic Relations and Conic Sections

### Chapter 10

#### 10.1 The Distance and Midpoint Formulas

The distance  $d$  between the points  $A(x_1, y_1)$  and  $B(x_2, y_2)$  is

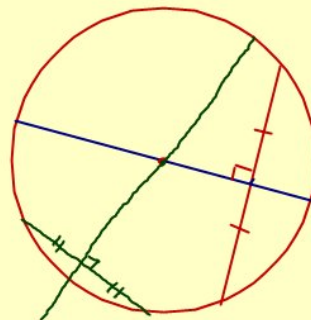
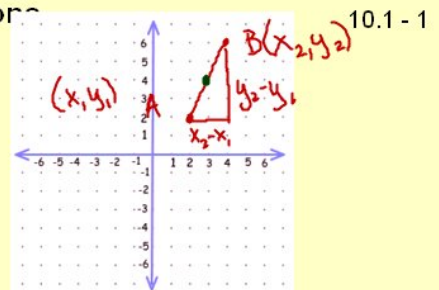
$$d = \sqrt{(y_2 - y_1)^2 + (x_2 - x_1)^2}$$

The midpoint of the line segment joining  $A(x_1, y_1)$  and  $B(x_2, y_2)$  is as follows:

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

\*\*Recall from geometry that the perpendicular bisector of a chord of a circle passes through the center of the circle.

Start homework together. Do 25, 41, 47, 57



Homework: 10.1 pg 592: 25, 27, 33, 41, 43, 47, 49, 57

$$25. (8, 3) (2, -1)$$

$$d = \sqrt{(-1-3)^2 + (2-8)^2}$$

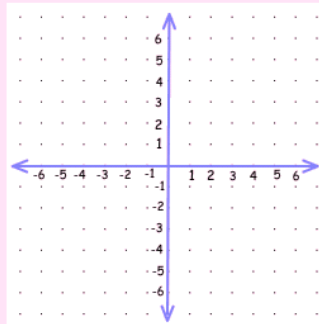
$$= \sqrt{16 + 36}$$

$$= \sqrt{52}$$

$$= 2\sqrt{13} \approx 7.2$$

$$M: \left( \frac{8+2}{2}, \frac{3+(-1)}{2} \right)$$

$$(5, 1)$$



$$41. (2, 2) (6, 14)$$

$$\text{midpt } \left( \frac{8}{2}, \frac{16}{2} \right) (4, 8)$$

$$m = \frac{14-2}{6-2} = \frac{12}{4} = 3$$

$$m_{\perp} = -\frac{1}{3}$$

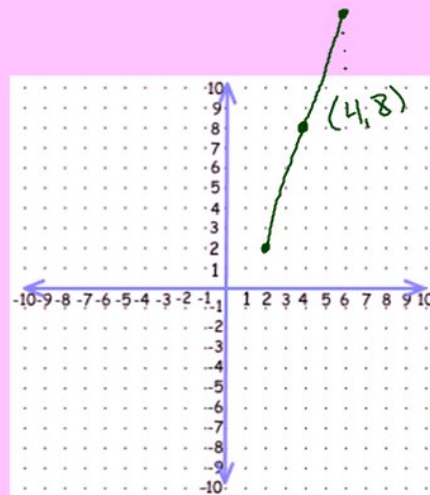
$$y - y_1 = m(x - x_1)$$

$$y - 8 = -\frac{1}{3}(x - 4)$$

$$y - 8 = -\frac{1}{3}x + \frac{4}{3}$$

$$y = -\frac{1}{3}x + \frac{4}{3} + \frac{24}{3}$$

$$y = -\frac{1}{3}x + \frac{28}{3}$$



$$47. (0,1) (x,4)$$

$$d = \sqrt{34}$$

$$\sqrt{34} = \sqrt{(x-0)^2 + (4-1)^2}$$

$$\sqrt{34} = \sqrt{x^2 + 9}$$

$$34 = x^2 + 9$$

$$25 = x^2$$

$$\pm 5 = x$$

