Algebra 2

10.1 & 10.2 Worksheet: Parabolas, Circles, Midpoint, & Distance

Name: Key Hour: _____

Given two points, find the distance between them and give the midpoint as an ordered pair.

1st 2nd

1. $(0, 2)$ & $(6, 3)$ Work Shown: $d = \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2}$

Distance: $\sqrt{37}$ $\sqrt{(6-0)^2 + (3-2)^2} = \sqrt{6^2+1^2} = \sqrt{36+1} = \sqrt{37}$

Midpoint: $(3, \frac{5}{2})$ $\left(\frac{0+6}{2}, \frac{2+3}{2}\right) \Rightarrow \left(\frac{6}{2}, \frac{5}{2}\right)$

2. $(-3, 1)$ & $(0, -6)$ Work Shown:

Distance: $\sqrt{58}$ $\sqrt{(0-(-3))^2 + (-6-1)^2} = \sqrt{3^2+(-7)^2} = \sqrt{9+49}$

Midpoint: $\left(-\frac{3}{2}, \frac{-5}{2}\right)$ $\left(\frac{-3+0}{2}, \frac{1-6}{2}\right)$

3. $(-4, 0)$ & $(3, 7)$ Work Shown:

Distance: $\sqrt{98}$ $\sqrt{(3-(-4))^2 + (7-0)^2} = \sqrt{(3+4)^2 + 7^2} = \sqrt{49+49}$

Midpoint: $-\frac{1}{2}, \frac{7}{2}$ $\left(\frac{-4+3}{2}, \frac{0+7}{2}\right)$

State which direction the parabolas open.

4. $y = -4x^2 + 8$ Down

5. $x^2 - y^2 + 4 = x + x^2$

$-x^2$ $-x^2$

$-y^2 + 4 = x$ left

6. $(y - 3)^2 - 1 = x$

$y^2 - 6y + 9 - 1 = x \Rightarrow y^2 - 6y + 8 = x$ right

7. $15x + (x + 1)^2 = 12x + 5y$

x is squared, y is not squared, the y term is positive up

Write the equation of the circle that matches the description given.

8. Center of $(-2, 5)$ with radius of 3

$(x+2)^2 + (y-5)^2 = 9$

9. Center moved right 5 and up 2 with a radius of 10

$\rightarrow 5$ $\uparrow 2$ so $(5, 2)$ is the center... $(x-5)^2 + (y-2)^2 = 10^2$

10. Center of $(3, -7)$ with radius of 8

$(x-3)^2 + (y+7)^2 = 8^2$

Given the equation of the circle, state the center and radius.

11. $(x + 23)^2 + y^2 = 9$

Center: $(-23, 0)$ Radius: 3

12. $(y + 1)^2 + (x + 6)^2 = 25$

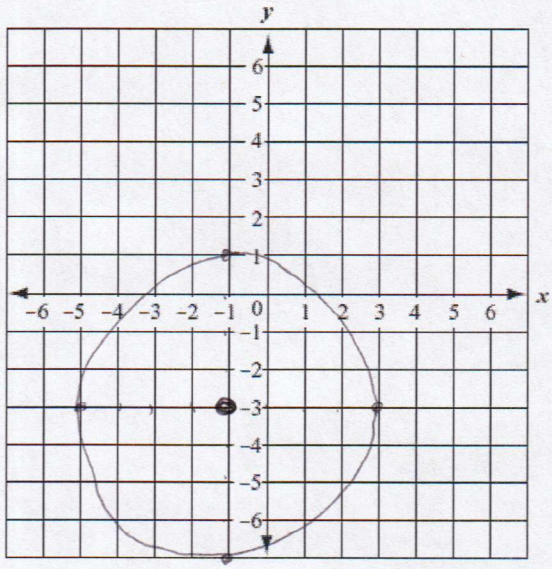
Center: $(-6, -1)$ Radius: 5

13. $x^2 + (y - 8)^2 = 110$

Center: $(0, 8)$ Radius: $\sqrt{110}$

Graph the circles.

14. $(x + 1)^2 + (y + 3)^2 = 16$



15. $y^2 + (x - 4)^2 = 4$