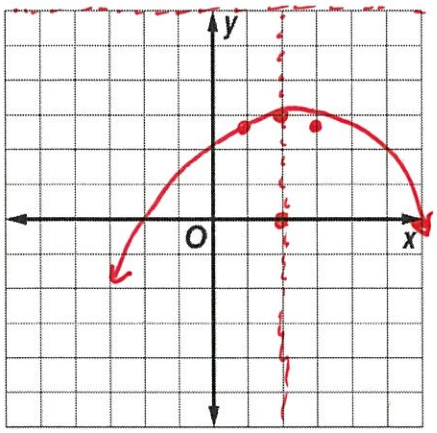
Pre-Calculus
REVIEW: 7.1-7.2 (Parabolas, Ellipses, Circles)

Name: Key

1. Graph the parabola given by $(x-2)^2 = -12(y-3)$.



$4p = -12$

$p = -3$

x	y
1	≈2.9
3	

2. Write the equation of the parabola: $y = x^2 + 14x - 104$ in standard form.

$49 + y + 104 = x^2 + 14x + 49$

$y + 153 = (x+7)^2$

For numbers 3 – 6, use the following equation: $\mathbf{2y^2 - 16y - 20x + 72 = 0}$.

or divide by '2' to begin with!

$2(y^2 - 8y + 16) = 20x - 72 + 32$

$\frac{2(y-4)^2}{2} = \frac{20x - 40}{2}$

$(y-4)^2 = 10(x-2)$

Right!

$10 = 4p$

$p = \frac{5}{2}$

3. Identify the vertex.

(2, 4)

4. Identify the focus.

~~(h, k+p)~~ ~~(2, 6.5)~~

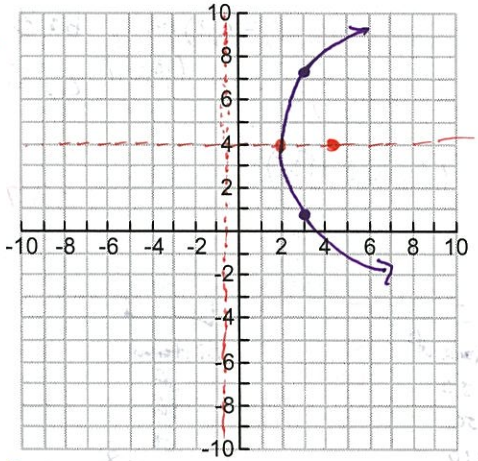
(h+p, k) (4.5, 4)

5. Identify the axis of symmetry.

$y = 4$

6. Identify the directrix.

$x = -.5$



$2y^2 - 16y - 60 + 72 = 0$

$y^2 - 8y + 6 = 0$

↑ Quad formula

x	y
3	≈.8
	≈7.2

For 7 and 8, determine the orientation of the parabola. (opens up/left/down/right)

7. vertex: (–5, 1), focus (–5, 3)

V ∴ F

UP!

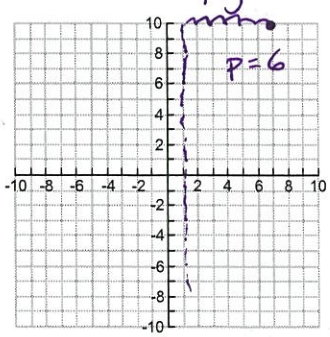
8. directrix: $y = 4$; $p = -2$

Down!

9. Write an equation for the parabola with vertex (7, 10) and directrix $x = 1$.

$24(x-7) = (y-10)^2$

Right!



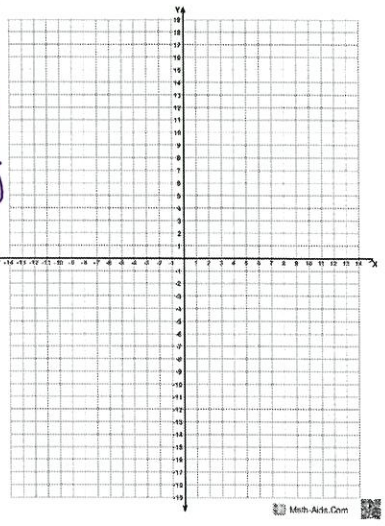
10. ~~Write the~~ equation for the graph of a parabola with vertex (8, 19) and focus (4.75, 19).

Left!

Distance between is 'p'. So $p = 3.25$

Left so -3.25!

$-13(x-8) = (y-19)^2$



11. Write $5x^2 + 2y^2 + 30x - 16y + 27 = 0$ in standard form.

$5x^2+30x+2y^2-16y=-27$

$5(x^2+6x+9)+2(y^2-8y+16)=-27+45+32$

$\frac{5(x+3)^2}{50}+\frac{2(y-4)^2}{50}=\frac{50}{50}$

$\frac{(x+3)^2}{10}+\frac{(y-4)^2}{25}=1$

12. Identify the conic in question number 11. (Is it a parabola, ellipse, or circle?)

13. Graph the ellipse given by $\frac{(x-9)^2}{9}+\frac{(y+3)^2}{36}=1$.

Identify the ordered pairs of the following:

opens up+down!

Center: $(9,-3)$

Vertices: $(h,k\pm a)=(9,3)$ and $(9,-9)$ $a:6$

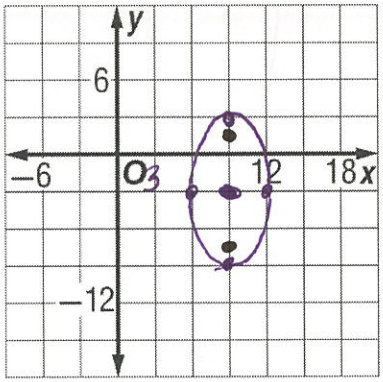
Co-Vertices: $(h\pm b,k)=(6,-3)$ and $(12,-3)$ $b:3$

Foci: $(h,k\pm c)=$ $c:3\sqrt{3}$

$(9,-3\pm3\sqrt{3})$

$c^2=36-9$

$\sqrt{c^2}=\sqrt{27}$



14. What is the equation for an ellipse with vertices (–7, –3), (13, –3) and foci (–5, –3), (11, –3)?

Distance of 20 so $a=10$, $a^2=100$

center $(3,-3)$

Distance of 16 so $c=8$, $c^2=64$

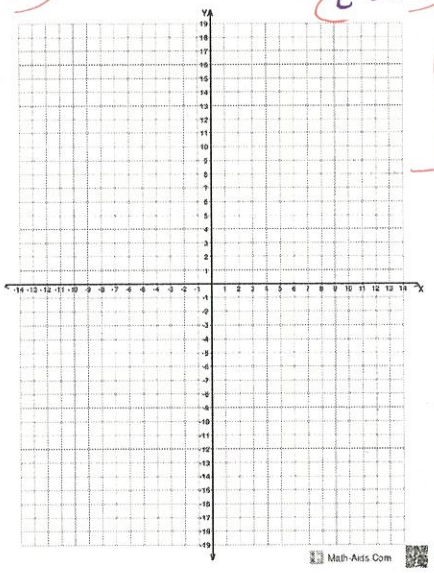
$c^2=a^2-b^2$

$64=100-b^2$

$b=6$

$b^2=36$

$\frac{(x-3)^2}{100}+\frac{(y+3)^2}{36}=1$



15. Write an equation, in standard form, for the ellipse with the given characteristics: foci (–6, 9), (–6, –3); length of major axis is 20.

$2c=12$ opens up+down $a=10$

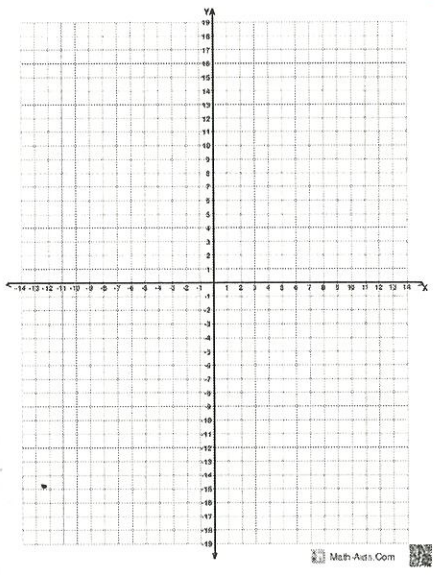
$c=6$ center: $(-6,3)$ $a^2=100$

$c^2=36$

$b^2=64$

$b=8$

$\frac{(x+6)^2}{64}+\frac{(y-3)^2}{100}=1$



16. Write the equation of a circle with a center located at (3, –2) and a radius 11 units long.

$(x-3)^2+(y+2)^2=121$