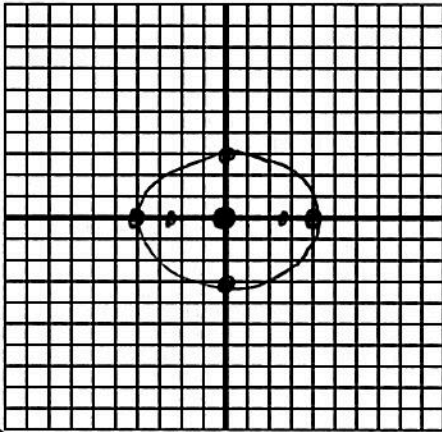


PAP PRECALCULUS
EVALUATE ELLIPSES

Name Key
Date _____ Period _____

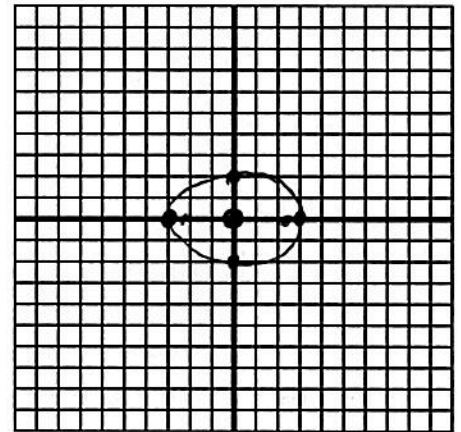
$$1) \frac{x^2}{16} + \frac{y^2}{9} = 1$$



$a = 4, b = 3$
 $c^2 = 16 - 9$
 $\sqrt{c^2} = \sqrt{7}$
 $c = \sqrt{7} \approx 2.6$

Center (0, 0)
Vertices (-4, 0) & (4, 0)
Co-vertices: (0, 3) & (0, -3)
Foci (-2.6, 0) & (2.6, 0)
Length of... Major Axis 8 Minor Axis 6

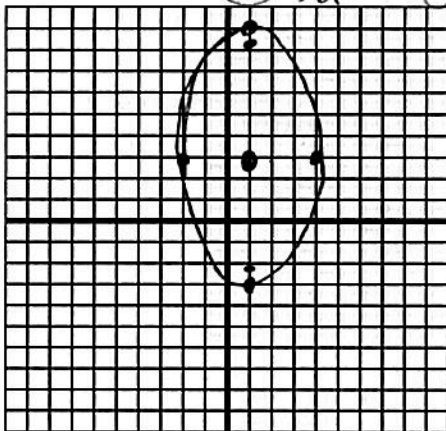
$$2) \frac{4x^2}{36} + \frac{9y^2}{36} = \frac{36}{36}$$



$\frac{x^2}{9} + \frac{y^2}{4} = 1$
 $a = 3, b = 2$
 $c^2 = 9 - 4$
 $c = \sqrt{5} \approx 2.2$

Center (0, 0)
Vertices (-3, 0) & (3, 0)
Co-vertices: (0, 2) & (0, -2)
Foci (-2.2, 0) & (2.2, 0)
Length of... Major Axis 6 Minor Axis 4

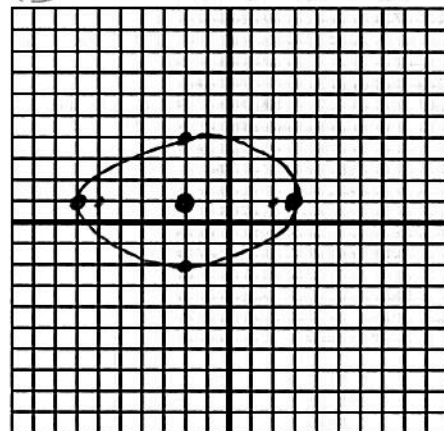
$$3) \frac{(x-1)^2}{9} + \frac{(y-3)^2}{36} = 1$$



$a = 6$
 $b = 3$
 $c^2 = 36 - 9$
 $c = \sqrt{27} \approx 5.2$

Center (1, 3)
Vertices (1, 9) & (1, -3)
Co-vertices: (-2, 3) & (4, 3)
Foci (1, 8.2) & (1, -2.2)
Length of... Major Axis 12 Minor Axis 6

$$4) \frac{(x+2)^2}{25} + \frac{(y-1)^2}{9} = 1$$



$a = 5$
 $b = 3$
 $c^2 = 25 - 9$
 $c = \sqrt{16} = 4$

Center (-2, 1)
Vertices (-7, 1) & (3, 1)
Co-vertices: (-2, 4) & (-2, -2)
Foci (-6, 1) & (2, 1)
Length of... Major Axis 10 Minor Axis 6

Complete the square to find the equations of the following ellipses in stand form.

5) $4x^2 + y^2 + 24x - 10y + 45 = 0$

$4x^2 + 24x + y^2 - 10y = -45$

$4(x^2 + \frac{6x}{2} + \frac{9}{2^2}) + (y^2 - \frac{10y}{2} + \frac{25}{(-5)^2}) = -45 + 36 + 25$

$\frac{4(x+3)^2}{16} + \frac{(y-5)^2}{16} = \frac{16}{16}$

$\frac{(x+3)^2}{4} + \frac{(y-5)^2}{16} = 1$

6) $5x^2 + 15y^2 + 10x + 30y = 100$

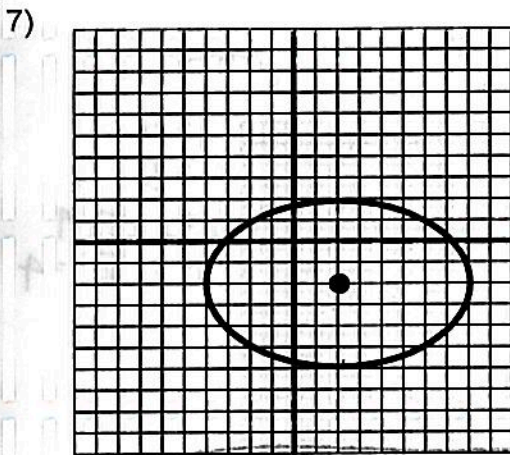
$5x^2 + 10x + 15y^2 + 30y = 100$

$5(x^2 + \frac{2x}{1} + \frac{1}{1^2}) + 15(y^2 + \frac{2y}{1} + \frac{1}{1^2}) = 100 + 5 + 15$

$\frac{5(x+1)^2}{120} + \frac{15(y+1)^2}{120} = \frac{120}{120}$

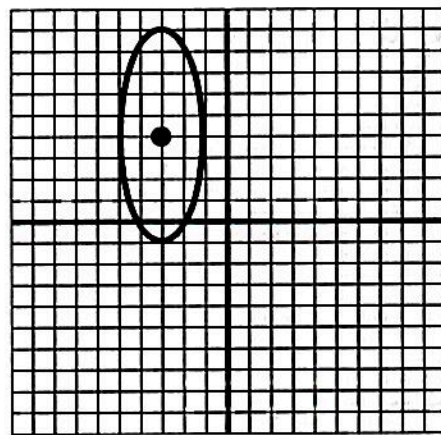
$\frac{(x+1)^2}{24} + \frac{(y+1)^2}{8} = 1$

Write the equation given the graph:



$a = 3, a^2 = 36$
 $b = 2, b^2 = 4$
 Center $(2, -2)$

$\frac{(x-2)^2}{36} + \frac{(y+2)^2}{4} = 1$



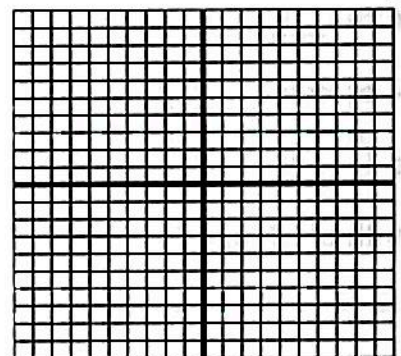
$a = 5, a^2 = 25$
 $b = 2, b^2 = 4$
 Center $(-3, 4)$

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

Write the equation of the ellipse described below:

9) The major axis is 20 units in length and is parallel to the y-axis. The minor axis is 6 units in length and the center is located at $(4, 2)$.

$a = 10$
 $a^2 = 100$
 $b = 3$
 $b^2 = 9$



$\frac{(x-4)^2}{9} + \frac{(y-2)^2}{100} = 1$