MATHEMATICS 5 SN Name_____

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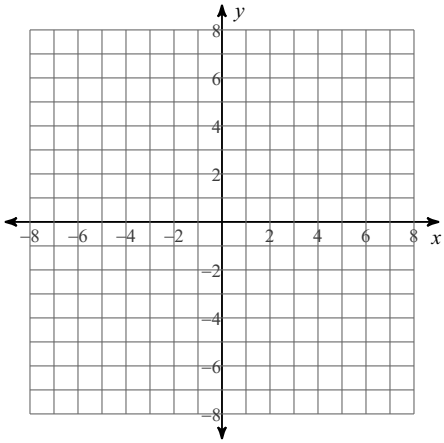
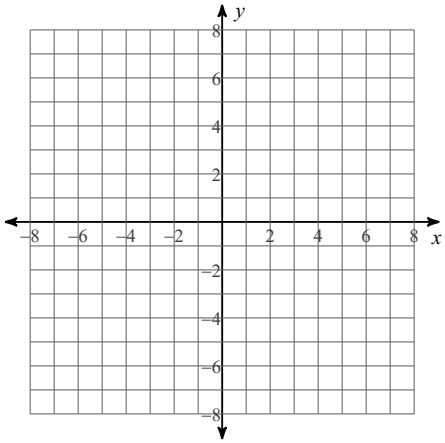
ELLIPSES

Identify the center, vertices, co-vertices, and foci of each. Then sketch the graph.

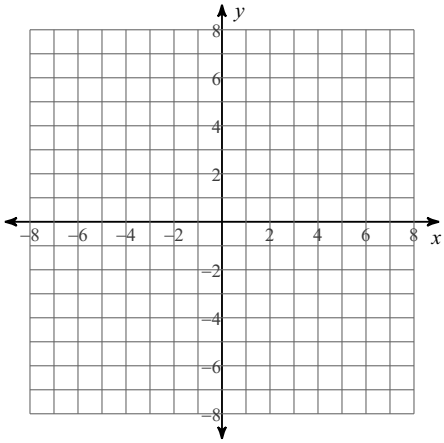
1) $\frac{(x+1)^2}{4} + \frac{(y-1)^2}{36} = 1$



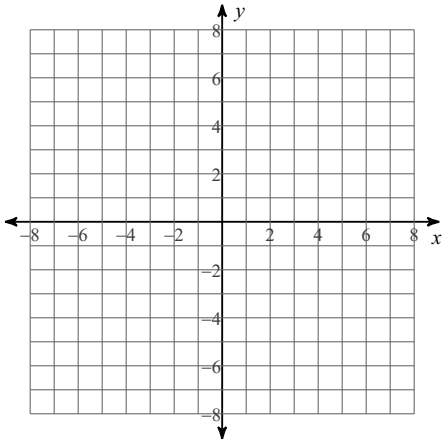
2) $\frac{(x+1)^2}{16} + \frac{(y-1)^2}{9} = 1$



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



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



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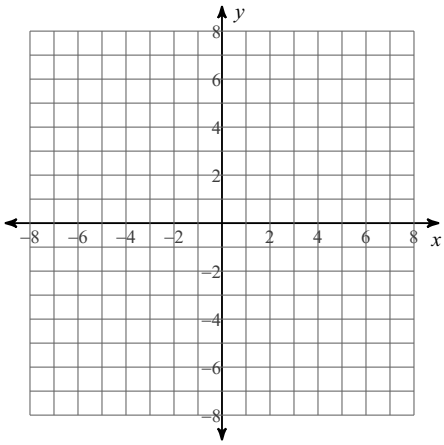
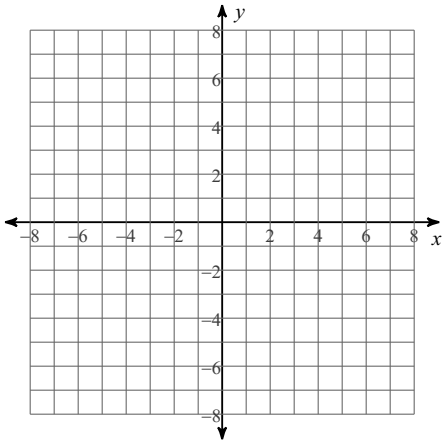
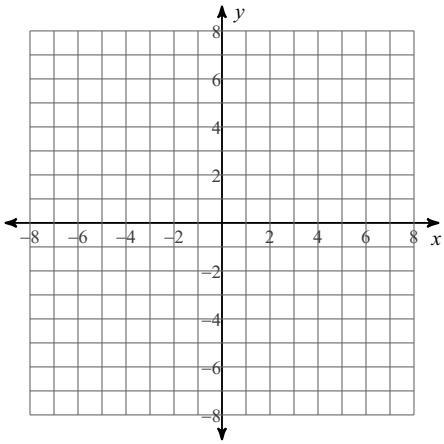
5) $\frac{(x+1)^2}{30} + \frac{y^2}{45} = 1$



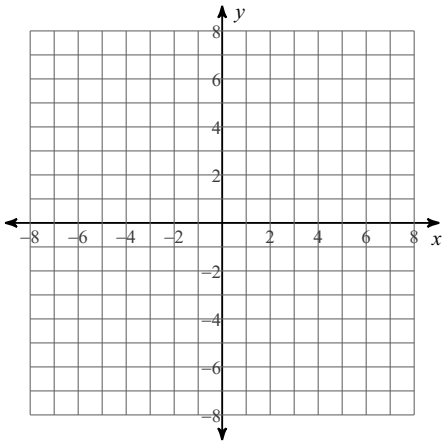
6) $(x+2)^2 + \frac{\left(y+\frac{3}{2}\right)^2}{16} = 1$



7) $\frac{(x+2)^2}{25} + (y-5)^2 = 1$



8) $\frac{x^2}{49} + \frac{(y-1)^2}{36} = 1$



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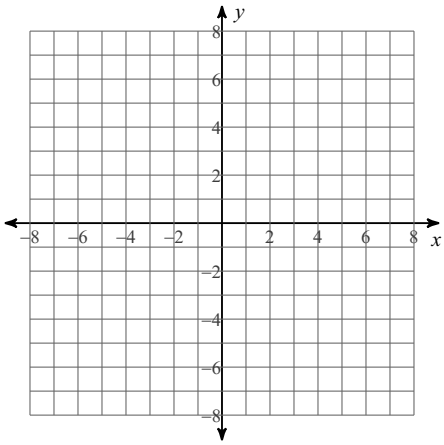
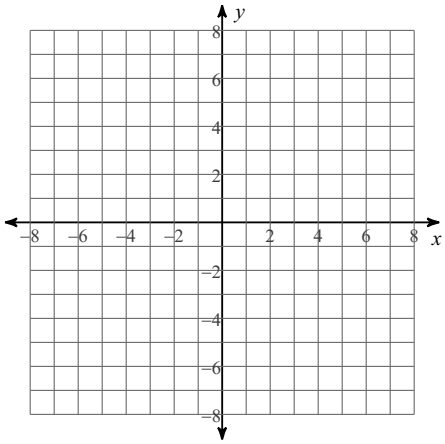
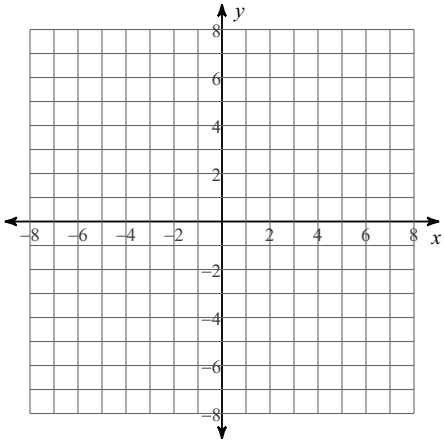
9) $\frac{(x-1)^2}{36} + \frac{(y+4)^2}{9} = 1$



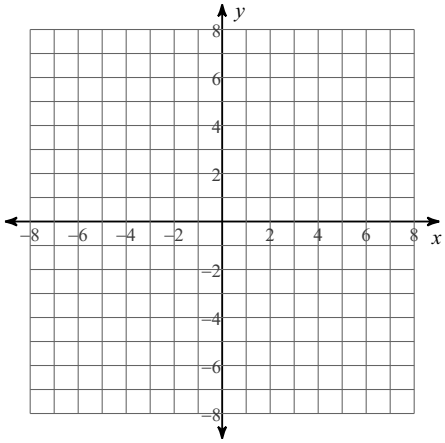
10) $9x^2 + 4y^2 + 54x + 8y - 59 = 0$



11) $25x^2 + 36y^2 + 50x - 144y - 731 = 0$



12) $25x^2 + 36y^2 + 144y - 756 = 0$



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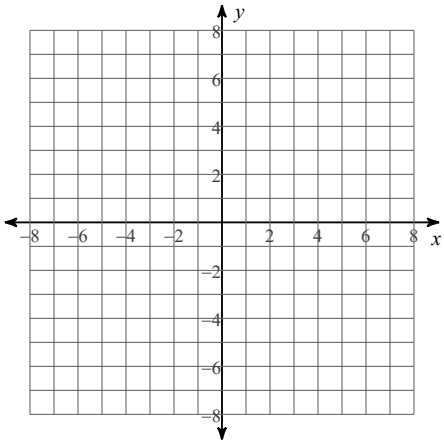
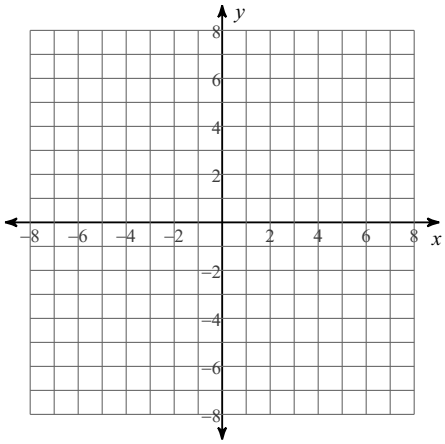
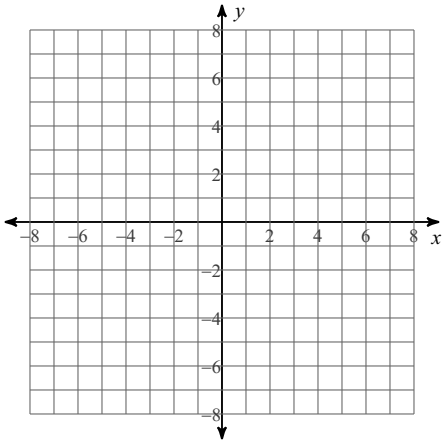
13) $x^2 + 4y^2 - 2x - 24y + 21 = 0$



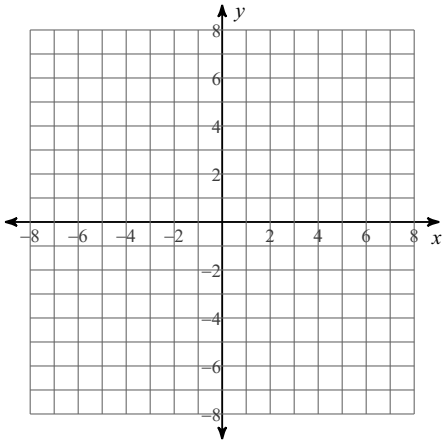
14) $25x^2 + 16y^2 - 64y - 336 = 0$



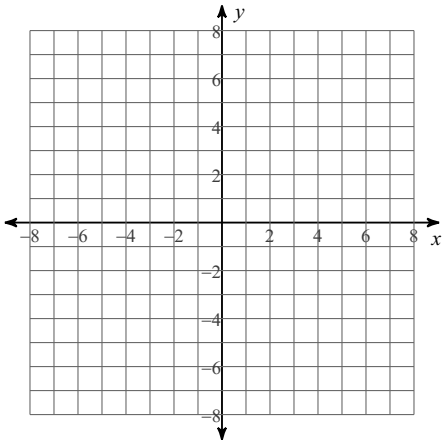
15) $16x^2 + 25y^2 + 64x + 150y - 111 = 0$



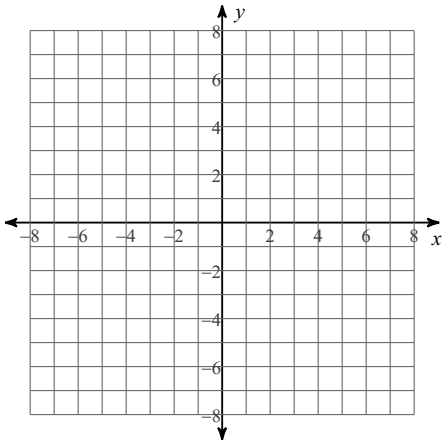
16) $16x^2 + 25y^2 + 32x - 384 = 0$



17) $16x^2 + 25y^2 - 64x - 336 = 0$



18) $x^2 + 4y^2 + 32y + 48 = 0$



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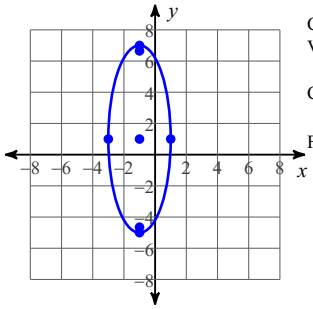
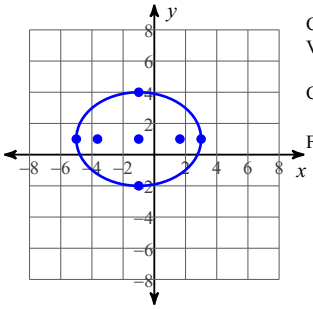
Answers to ELLIPSES

1)



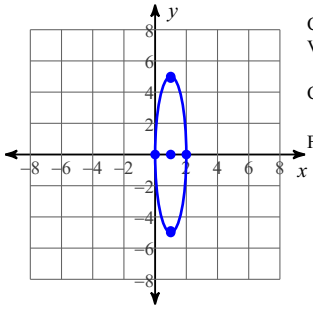
Center: $(-1, 1)$
Vertices: $(-1, 7)$
$(-1, -5)$
Co-vertices: $(1, 1)$
$(-3, 1)$
Foci: $(-1, 1 + 4\sqrt{2})$
$(-1, 1 - 4\sqrt{2})$

2)



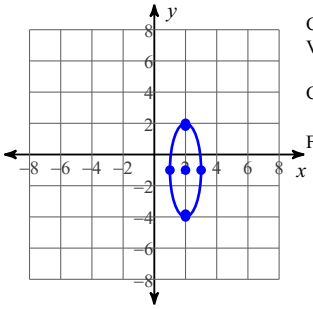
Center: $(-1, 1)$
Vertices: $(3, 1)$
$(-5, 1)$
Co-vertices: $(-1, 4)$
$(-1, -2)$
Foci: $(-1 + \sqrt{7}, 1)$
$(-1 - \sqrt{7}, 1)$

3)



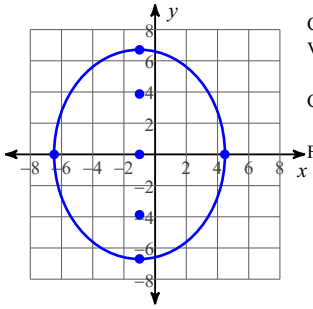
Center: $(1, 0)$
Vertices: $(1, 5)$
$(1, -5)$
Co-vertices: $(2, 0)$
$(0, 0)$
Foci: $(1, 2\sqrt{6})$
$(1, -2\sqrt{6})$

4)



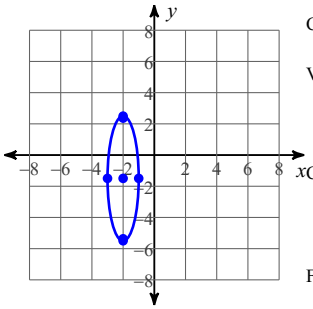
Center: $(2, -1)$
Vertices: $(2, 2)$
$(2, -4)$
Co-vertices: $(3, -1)$
$(1, -1)$
Foci: $(2, -1 + 2\sqrt{2})$
$(2, -1 - 2\sqrt{2})$

5)



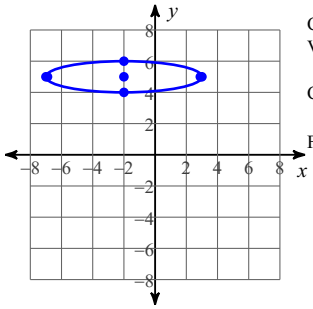
Center: $(-1, 0)$
Vertices: $(-1, 3\sqrt{5})$
$(-1, -3\sqrt{5})$
Co-vertices: $(-1 + \sqrt{30}, 0)$
$(-1 - \sqrt{30}, 0)$
Foci: $(-1, \sqrt{15})$
$(-1, -\sqrt{15})$

6)



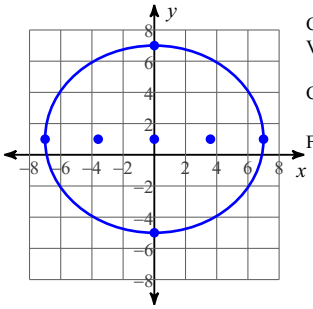
Center: $\left(-2, -\frac{3}{2}\right)$
Vertices: $\left(-2, \frac{5}{2}\right)$
$\left(-2, -\frac{11}{2}\right)$
Co-vertices: $\left(-1, -\frac{3}{2}\right)$
$\left(-3, -\frac{3}{2}\right)$
Foci: $\left(-2, \frac{2\sqrt{15} - 3}{2}\right)$
$\left(-2, \frac{-2\sqrt{15} - 3}{2}\right)$

7)



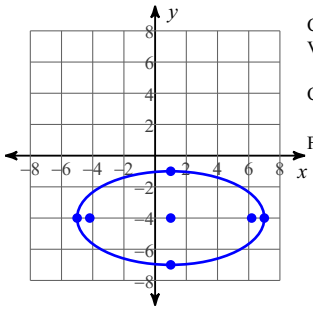
Center: $(-2, 5)$
Vertices: $(3, 5)$
$(-7, 5)$
Co-vertices: $(-2, 6)$
$(-2, 4)$
Foci: $(-2 + 2\sqrt{6}, 5)$
$(-2 - 2\sqrt{6}, 5)$

8)



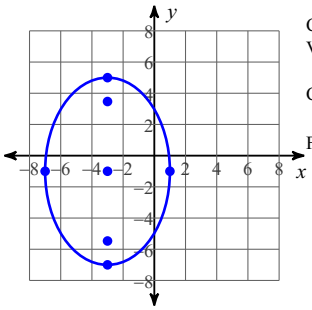
Center: $(0, 1)$
Vertices: $(7, 1)$
$(-7, 1)$
Co-vertices: $(0, 7)$
$(0, -5)$
Foci: $(\sqrt{13}, 1)$
$(-\sqrt{13}, 1)$

9)



Center: $(1, -4)$
Vertices: $(7, -4)$
$(-5, -4)$
Co-vertices: $(1, -1)$
$(1, -7)$
Foci: $(1 + 3\sqrt{3}, -4)$
$(1 - 3\sqrt{3}, -4)$

10)



Center: $(-3, -1)$
Vertices: $(-3, 5)$
$(-3, -7)$
Co-vertices: $(1, -1)$
$(-7, -1)$
Foci: $(-3, -1 + 2\sqrt{5})$
$(-3, -1 - 2\sqrt{5})$

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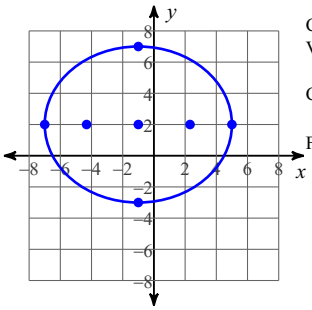
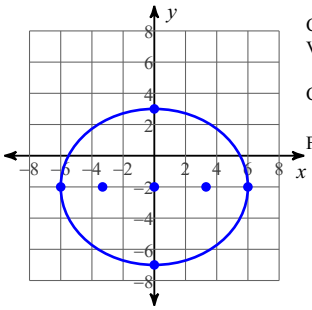
11)



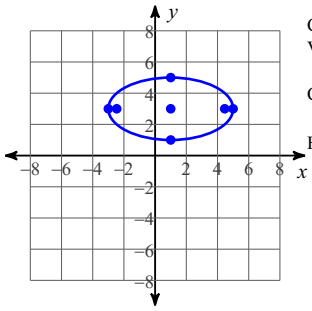
Center: $(-1, 2)$
Vertices: $(5, 2)$
$(-7, 2)$
Co-vertices: $(-1, 7)$
$(-1, -3)$
Foci: $(-1 + \sqrt{11}, 2)$
$(-1 - \sqrt{11}, 2)$

12)



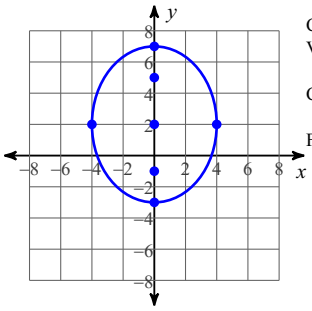
Center: $(0, -2)$
Vertices: $(6, -2)$
$(-6, -2)$
Co-vertices: $(0, 3)$
$(0, -7)$
Foci: $(\sqrt{11}, -2)$
$(-\sqrt{11}, -2)$

13)



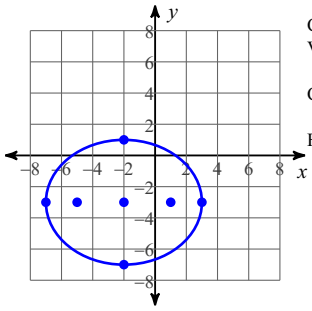
Center: $(1, 3)$
Vertices: $(5, 3)$
$(-3, 3)$
Co-vertices: $(1, 5)$
$(1, 1)$
Foci: $(1 + 2\sqrt{3}, 3)$
$(1 - 2\sqrt{3}, 3)$

14)



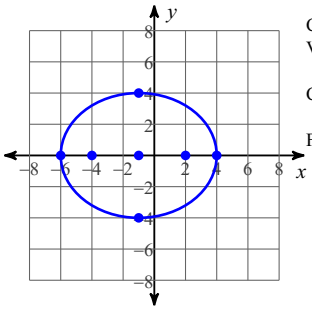
Center: $(0, 2)$
Vertices: $(0, 7)$
$(0, -3)$
Co-vertices: $(4, 2)$
$(-4, 2)$
Foci: $(0, 5)$
$(0, -1)$

15)



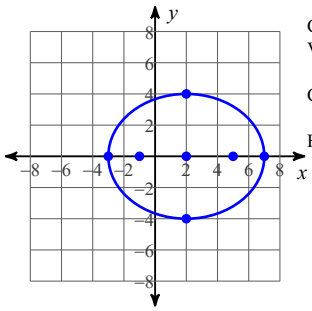
Center: $(-2, -3)$
Vertices: $(3, -3)$
$(-7, -3)$
Co-vertices: $(-2, 1)$
$(-2, -7)$
Foci: $(1, -3)$
$(-5, -3)$

16)



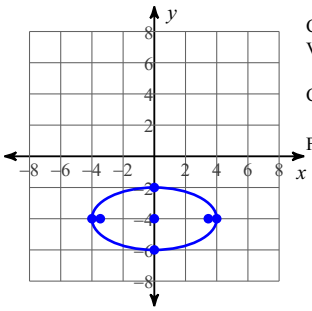
Center: $(-1, 0)$
Vertices: $(4, 0)$
$(-6, 0)$
Co-vertices: $(-1, 4)$
$(-1, -4)$
Foci: $(2, 0)$
$(-4, 0)$

17)



Center: $(2, 0)$
Vertices: $(7, 0)$
$(-3, 0)$
Co-vertices: $(2, 4)$
$(2, -4)$
Foci: $(5, 0)$
$(-1, 0)$

18)



Center: $(0, -4)$
Vertices: $(4, -4)$
$(-4, -4)$
Co-vertices: $(0, -2)$
$(0, -6)$
Foci: $(2\sqrt{3}, -4)$
$(-2\sqrt{3}, -4)$

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