

$$(x+2)(x+\frac{5}{6}) = 0$$

$$x^2 + \frac{5}{6}x + 2x + \frac{5}{3} = 0$$

$$6x^2 + 5x + 12x + 10 = 0$$

18. Find a quadratic equation with roots  $-2$  and  $-\frac{5}{6}$ .

[A]  $6x^2 - 17x + 10 = 0$  ✓

[B]  $6x^2 - 17x - 10 = 0$

[C]  $6x^2 + 17x + 10 = 0$

[D]  $6x^2 + 17x - 10 = 0$

[18] \_\_\_\_\_

19. Find the equation of the axis of symmetry of  $f(x) = x^2 + 2x - 10$ .

[A]  $x = -1$  ✓

[B]  $x = 1$

[C]  $x = \frac{1}{5}$

[D]  $x = -\frac{1}{5}$

$$y = (x^2 + 2x + 1) - 10 - 1$$

[19] \_\_\_\_\_

20. Given the quadratic function  $f(x) = 3(x-7)^2 + 4$ , find the vertex of its graph.

[A]  $(-7, 4)$

[B]  $(7, -4)$

[C]  $(7, 4)$  ✓

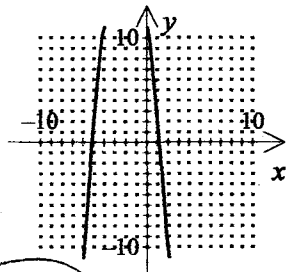
[D]  $(-7, -4)$

[20] \_\_\_\_\_

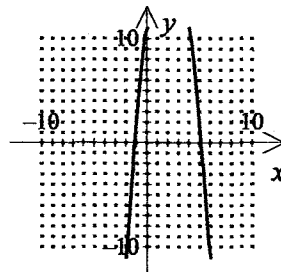
21. Write the following equation in the form  $y = a(x-h)^2 + k$  and graph.

$$y = -2x^2 + 8x - 12$$

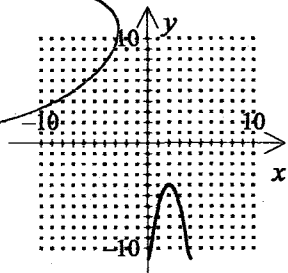
[A]



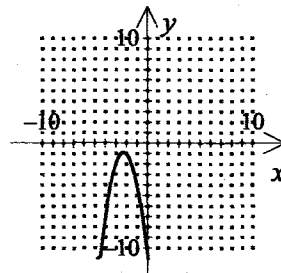
[B]



[C]



[D]



[21] \_\_\_\_\_

$$y = -2(x^2 - 4x + 4) - 12 + 8$$

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

# STAT QUAD REG

22. Which of the following is true for the parabola that passes through  $(-1, 1)$ ,  $(1, -11)$ , and  $(0, -8)$ ?

[A] The  $x$  squared coefficient is 4.

[B] The constant term is  $-8$ . ✓

[C] none of these

[D] The  $x$  coefficient is  $-4$ .

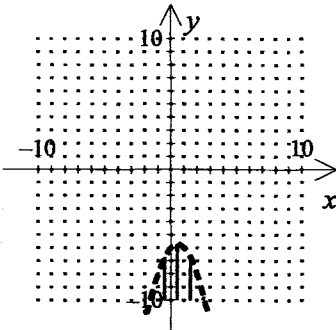
$$y = 3x^2 - 6x - 8$$

[22] \_\_\_\_\_

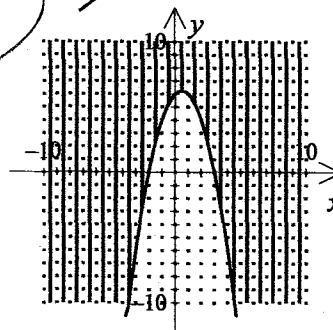
23. Graph:  $y > -x^2 + x + 6$

$$-(x^2 - x + \frac{1}{4}) + 6 - \frac{1}{4} = -(x - \frac{1}{2})^2 + \frac{23}{4}$$

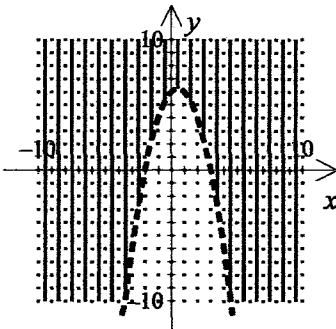
[A]



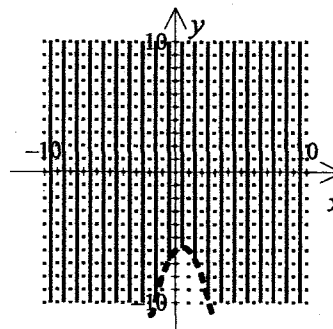
[B] ✓



[C]



[D]



[23] \_\_\_\_\_

24. Solve:  $x^2 - 12x + 35 > 0$

[A]  $x < 5$  or  $x > 7$  ✓

[B]  $-7 < x < -5$

[C]  $x < -7$  or  $x > -5$

[D]  $5 < x < 7$

[24] \_\_\_\_\_

$$(x-7)(x-5) > 0$$

$$x-7 > 0$$

$$x-5 > 0$$

$$(x-7) < 0$$

$$(x-5) < 0$$

$$x > 7$$

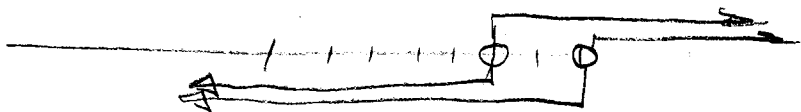
$$x > 5$$

$$x < 7$$

$$x < 5$$

5

or  $x > 7$   
 $x < 5$



$$D = \sqrt{(-5+1)^2 + (2+1)^2} = \sqrt{16+9}$$

25. Find the distance between the points  $(-5, 2)$  and  $(-1, -1)$ .

[A] 37

[B] 25

[C]  $\sqrt{37}$

[D] 5

[25] \_\_\_\_\_

26. Find the midpoint of the segment connecting  $(17, 1)$  and  $(8, -16)$ .

[A]  $(-25, 15)$

[B]  $(25, -15)$

[C]  $\left(\frac{25}{2}, -\frac{15}{2}\right)$

[D]  $\left(\frac{9}{2}, \frac{17}{2}\right)$

[26] \_\_\_\_\_

27. Find an equation for the parabola with focus at  $(-10, 4)$  and vertex at  $(2, 4)$ .

[A]  $y^2 + 8y + 48x + 112 = 0$

[B]  $x^2 - 4x + 48y + 132 = 0$

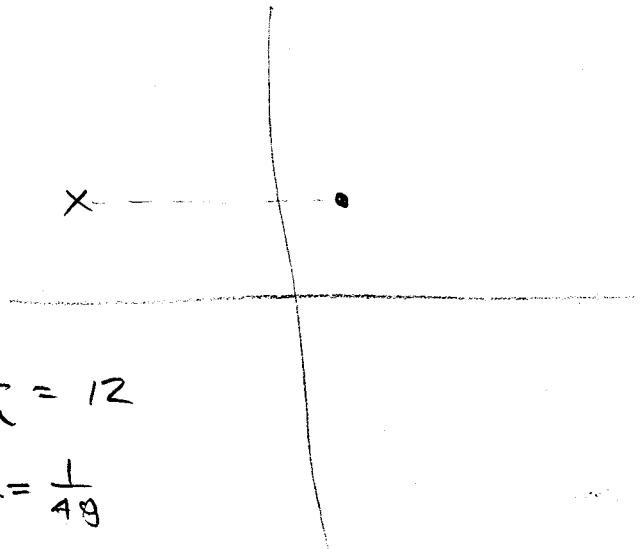
[C]  $y^2 - 8y + 48x - 80 = 0$

[D]  $x^2 - 4x + 48y - 32 = 0$

[27] \_\_\_\_\_

$$M = \frac{17+8}{2}, \frac{1-16}{2}$$

$$M = \left(\frac{25}{2}, -\frac{15}{2}\right)$$



$$x = -\frac{1}{48}(y-4)^2 + 2$$

$$-48x = y^2 - 8y + 16 - 96$$

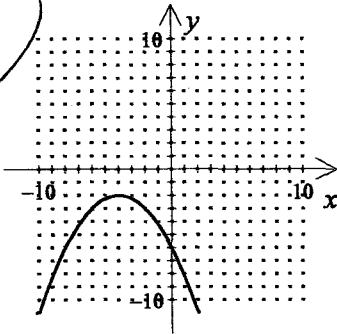
$$\frac{1}{4a} = 12$$

$$a = \frac{1}{48}$$

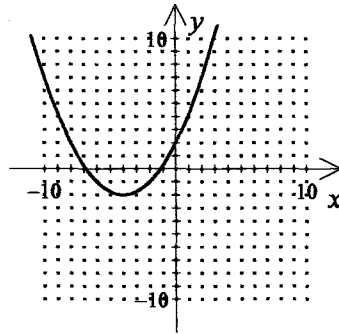
$$0 = y^2 - 8y + 48x - 80$$

28. Find an equation for the parabola with focus  $(-4, -3)$  and directrix  $y = -1$ . Which of the following is the graph of the equation?

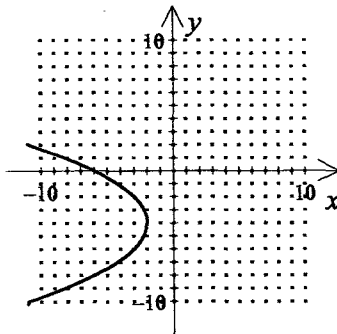
[A]



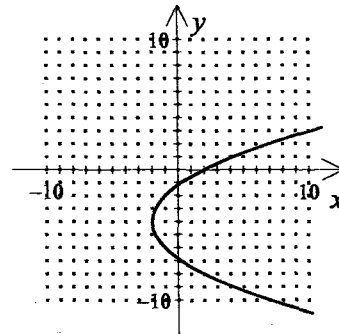
[B]



[C]



[D]



[28] \_\_\_\_\_

29. Find the equation of the circle with center  $(4, -2)$  and radius of 2.

[A]  $(x+4)^2 + (y-2)^2 = 2$

[B]  $(x-4)^2 + (y-2)^2 = 4$

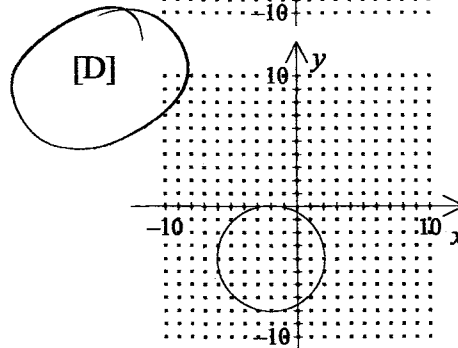
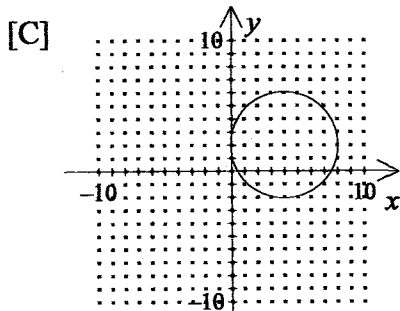
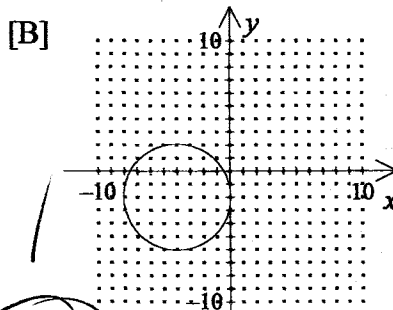
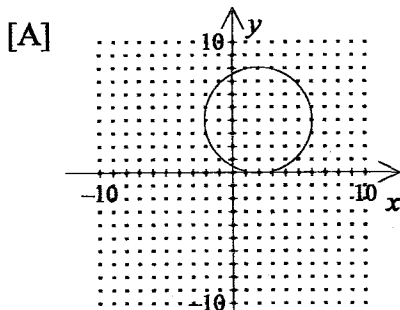
[C]  $(x+4)^2 - (y-2)^2 = 2$

[D]  $(x-4)^2 + (y+2)^2 = 4$

[29] \_\_\_\_\_

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

30. Sketch the graph of  $(x+2)^2 + (y+4)^2 = 16$



[30] \_\_\_\_\_

31. Determine the center, vertices, and foci for the following ellipse.

$$2x^2 + y^2 - 12x + 4y = -14$$

[A] center:  $(-3, 2)$   
 vertices:  $(-3, 3)$   $(-3, 1)$   
 foci:  $(0, 3)$   $(-4, 3)$

[B] center:  $(3, -2)$   
 vertices:  $(3, -2 + 2\sqrt{2})$   $(3, -2 - 2\sqrt{2})$   
 foci:  $(3, 0)$   $(3, -4)$

[C] center:  $(3, -2)$   
 vertices:  $(-3, -2 + 2\sqrt{2})$   $(-3, -2 - 2\sqrt{2})$   
 foci:  $(-3, 0)$   $(-3, -4)$

[D] center:  $(-3, 2)$   
 vertices:  $(7, -4)$   $(5, -4)$   
 foci:  $(0, -3)$   $(-4, -3)$

[31] \_\_\_\_\_

$(-3)^2$   
9

$$(2x^2 - 12x) + (y^2 + 4y) = -14$$

$$2(x^2 - 6x + 9) + (y^2 + 4y + 4) = -14 + 18 + 4$$

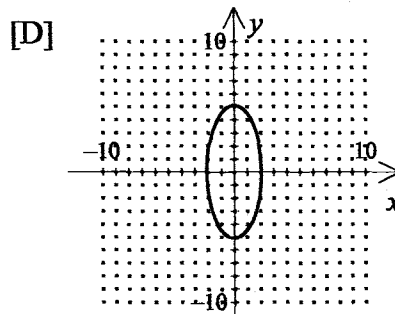
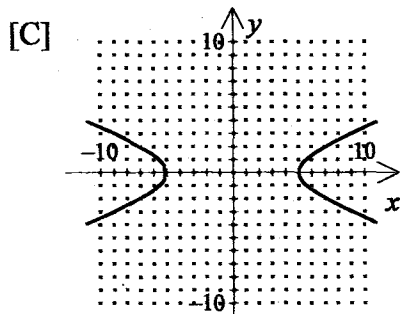
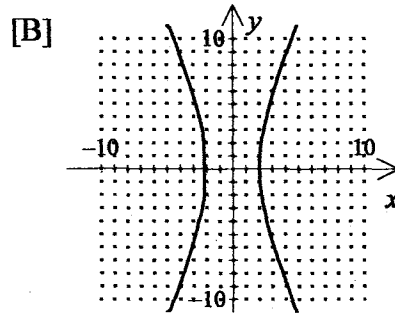
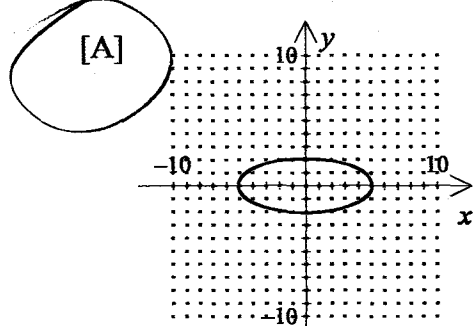
$$\frac{2(x-3)^2}{8} + \frac{(y+2)^2}{8} = \frac{8}{8}$$

$$\frac{(x-3)^2}{4} + \frac{(y+2)^2}{8} = 1$$

C:  $(3, -2)$   
 F:  $(3, 0)$   
 $(3, -4)$

$$\frac{x^2}{25} + \frac{y^2}{4} = 1$$

32. Which of the following is the graph of the equation  $4x^2 + 25y^2 = 100$ ?



[32] \_\_\_\_\_

33. Write an equation for the hyperbola with vertices  $(2, 0)$  and  $(-2, 0)$  and asymptote  $y = 2x$ .

[A]  $16x^2 - 4y^2 = 64$

[B]  $16x^2 - 16y^2 = 64$

[C]  $4x^2 - 16y^2 = 64$

[D]  $16x^2 + 4y^2 = 64$

[33] \_\_\_\_\_

$$\frac{16}{64} \frac{x^2}{4} - \frac{4}{64} \frac{y^2}{16} = 1$$

$$2 = \frac{a}{b}$$

$$2 = \frac{b}{2}$$

$$b = 4$$

