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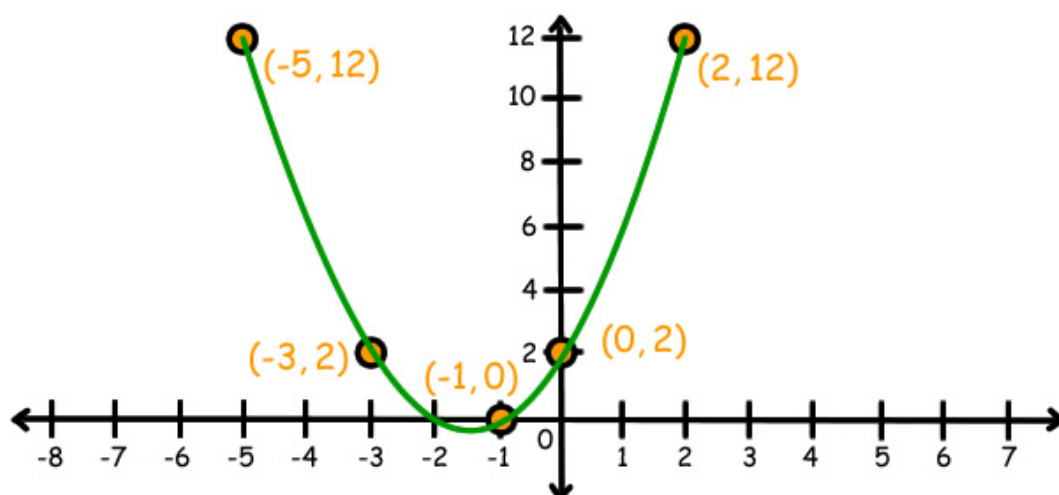
Ask Question ▶

Graph x^2+3x+2

Question

Answer

x	$y = x^2 + 3x + 2$
-5	$y = (-5)^2 + 3(-5) + 2 = 12$
-3	$y = (-3)^2 + 3(-3) + 2 = 2$
-1	$y = (-1)^2 + 3(-1) + 2 = 0$
0	$y = 0^2 + 3 \times 0 + 2 = 2$
2	$y = 2^2 + 3 \times 2 + 2 = 12$



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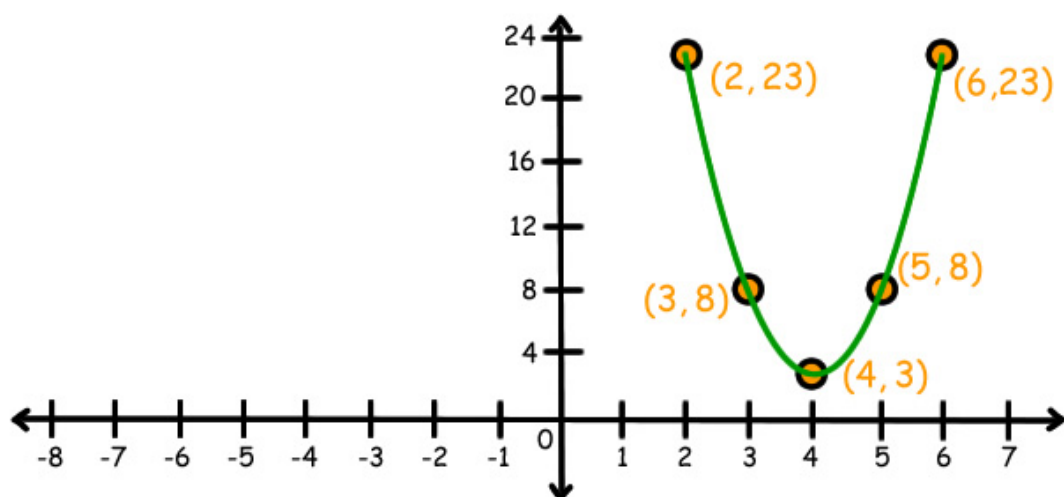


Graph $5(x-4)^2+3$

Question

Answer

x	$y = 5(x - 4)^2 + 3$
2	$y = 5(2 - 4)^2 + 3 = 23$
3	$y = 5(3 - 4)^2 + 3 = 8$
4	$y = 5(4 - 4)^2 + 3 = 3$
5	$y = 5(5 - 4)^2 + 3 = 8$
6	$y = 5(6 - 4)^2 + 3 = 23$



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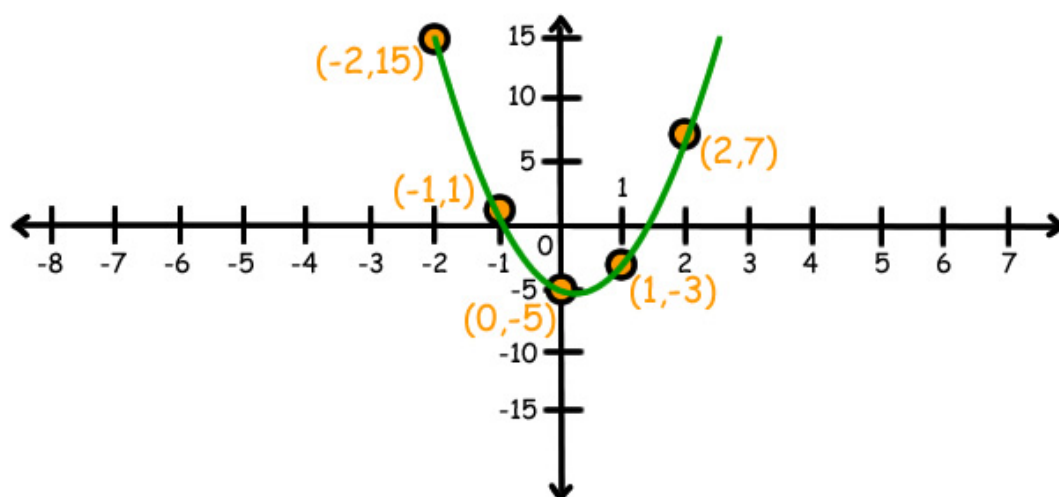


Graph $4x^2 - 2x - 5$

Question

Answer

x	$y = 4x^2 - 2x - 5$
-2	$y = 4(-2)^2 - 2(-2) - 5 = 15$
-1	$y = 4(-1)^2 - 2(-1) - 5 = 1$
0	$y = 4(0)^2 - 2(0) - 5 = -5$
1	$y = 4(1)^2 - 2(1) - 5 = -3$
2	$y = 4(2)^2 - 2(2) - 5 = 7$



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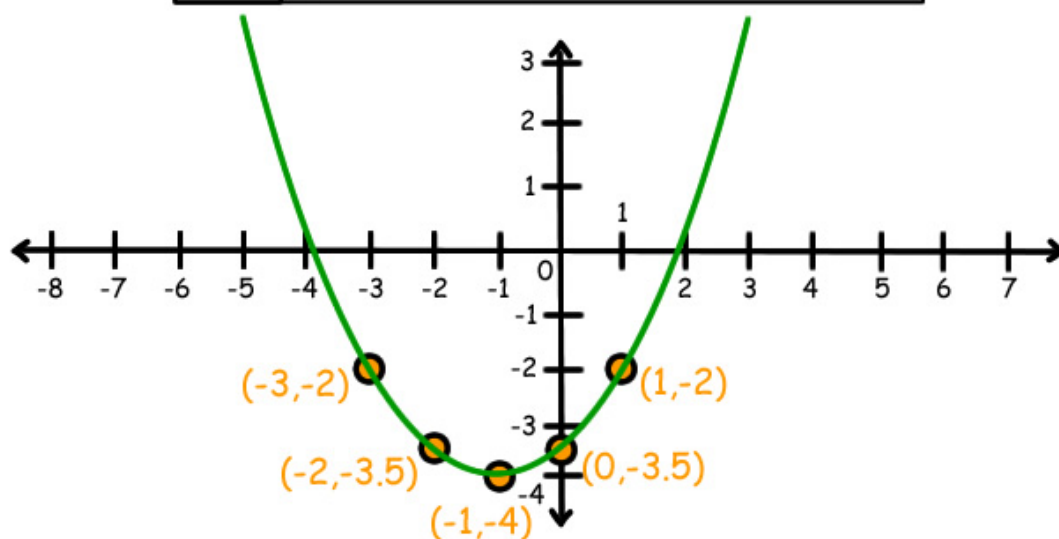


Graph $0.5(x+1)^2 - 4$

Question

Answer

x	$y = 0.5(x+1)^2 - 4$
-3	$y = 0.5(-3+1)^2 - 4 = -2$
-2	$y = 0.5(-2+1)^2 - 4 = -3.5$
-1	$y = 0.5(-1+1)^2 - 4 = -4$
0	$y = 0.5(0+1)^2 - 4 = -3.5$
1	$y = 0.5(1+1)^2 - 4 = -2$



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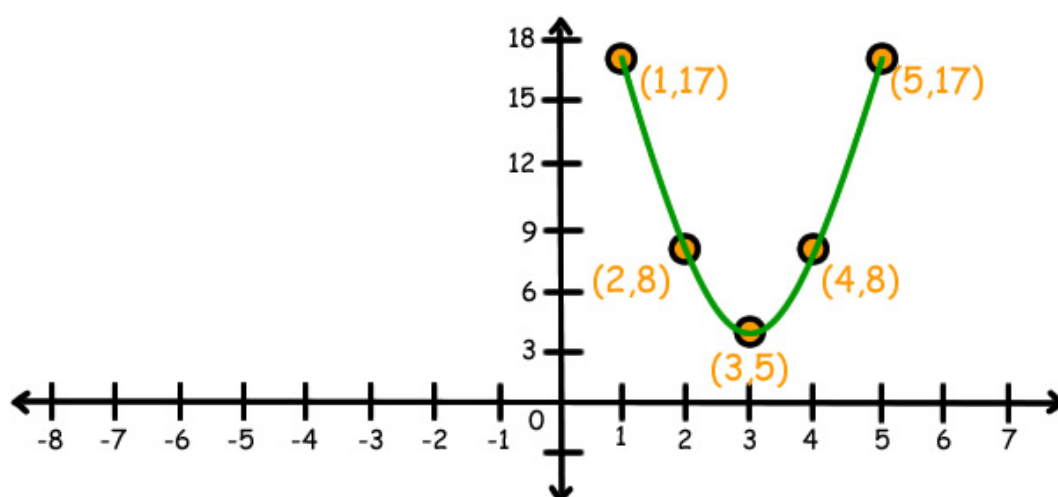


Graph $3(x-3)^2+5$

Question

Answer

x	$y = 3(x-3)^2 + 5$
1	$y = 3(1-3)^2 + 5 = 17$
2	$y = 3(2-3)^2 + 5 = 8$
3	$y = 3(3-3)^2 + 5 = 5$
4	$y = 3(4-3)^2 + 5 = 8$
5	$y = 3(5-3)^2 + 5 = 17$



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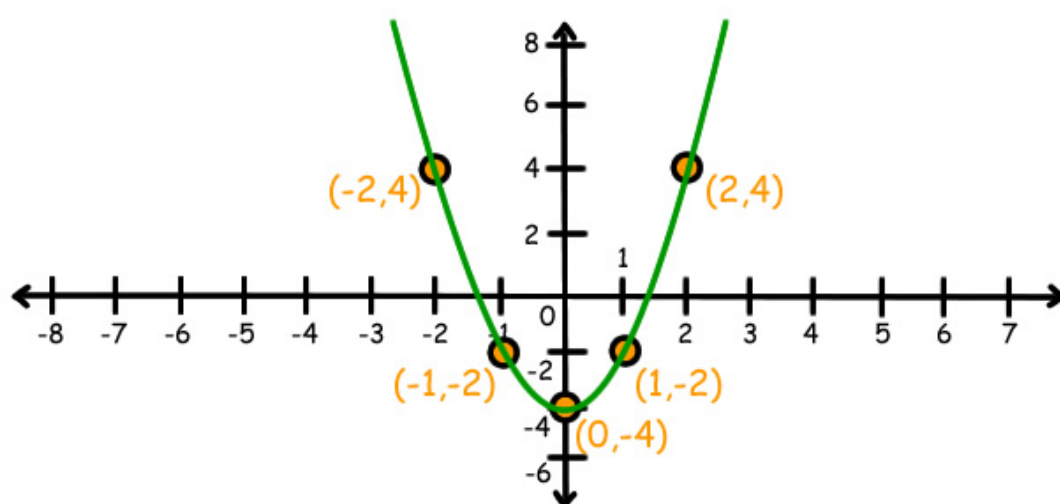
Ask Question ▶

Graph $2x^2 - 4$

Question

Answer

x	$y = 2x^2 - 4$
-2	$y = 2(-2)^2 - 4 = 4$
-1	$y = 2(-1)^2 - 4 = -2$
0	$y = 2(0)^2 - 4 = -4$
1	$y = 2(1)^2 - 4 = -2$
2	$y = 2(2)^2 - 4 = 4$



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Find the vertex of $4(x - 3)^2 + 3$.

Question

$$y = 4(x - 3)^2 + 3$$

$$y = a(x - h)^2 + k$$

$$a = 4, h = 3, k = 3$$

$$\text{Vertex} = (h, k) = (3, 3)$$

Answer

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Find the vertex of $5(x + 3)^2 - 3$.

Question

Answer

$$y = 5(x + 3)^2 - 3$$

$$y = 5[x - (-3)]^2 - 3$$

$$y = a(x - h)^2 + k$$

$$a = 5, h = -3, k = -3$$

$$\text{Vertex} = (h, k) = (-3, -3)$$

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Find the vertex of $6(x + 1)^2 - 4$.

Question

$$y = 6(x + 1)^2 - 4$$

$$y = 6[x - (-1)]^2 - 4$$

$$y = a(x - h)^2 + k$$

$$a = 6, h = -1, k = -4$$

$$\text{Vertex} = (h, k) = (-1, -4)$$

Answer

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Find the vertex of $10x^2 + 5$.

Question

Answer

$$y = 10x^2 + 5$$

$$y = 10(x - 0)^2 + 5$$

$$y = a(x - h)^2 + k$$

$$a = 10, h = 0, k = 5$$

$$\text{Vertex} = (h, k) = (0, 5)$$

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Find the parabola of vertex (10,5) and leading coefficient 1 in the standard form.

Question

Answer

$$a = 1, (h, k) = (10, 5)$$

$$y = a(x - h)^2 + k$$

$$y = 1(x - 10)^2 + 5$$

$$y = (x - 10)^2 + 5$$

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Questions?
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Ask Question ▶

Find the parabola of vertex (1, 1) and leading coefficient 5 in the standard form.

Question

Answer

$$a = 5, (h, k) = (1, 1)$$

$$y = a(x - h)^2 + k$$

$$y = 5(x - 1)^2 + 1$$

$$y = 5(x - 1)^2 + 1$$

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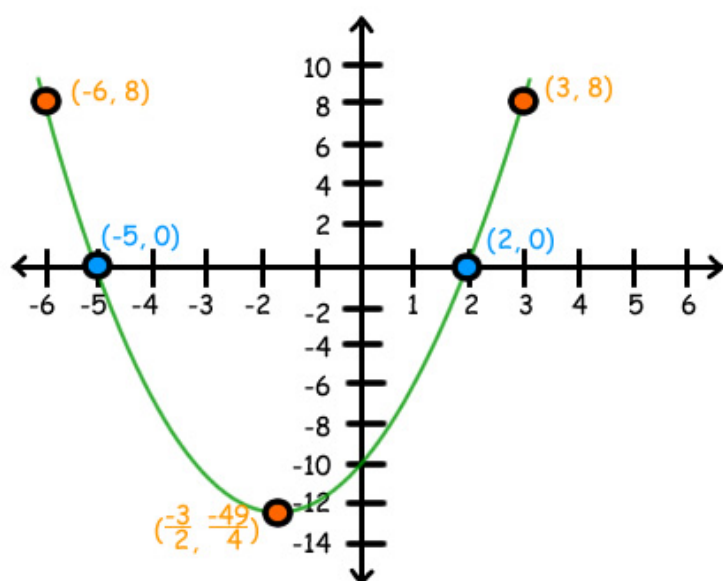
Ask Question ▶

Solve $x^2 + 3x - 10 = 0$ by graphing.

Question

Answer

x	$y = x^2 + 3x - 10$
-6	$y = (-6)^2 + 3(-6) - 10 = 8$
-5	$y = (-5)^2 + 3(-5) - 10 = 0$
$-\frac{3}{2}$	$y = (-\frac{3}{2})^2 + 3(-\frac{3}{2}) - 10 = -\frac{49}{4}$
2	$y = (2)^2 + 3(2) - 10 = 0$
3	$y = (3)^2 + 3(3) - 10 = 8$



$$x = -5 \text{ or } x = 2$$

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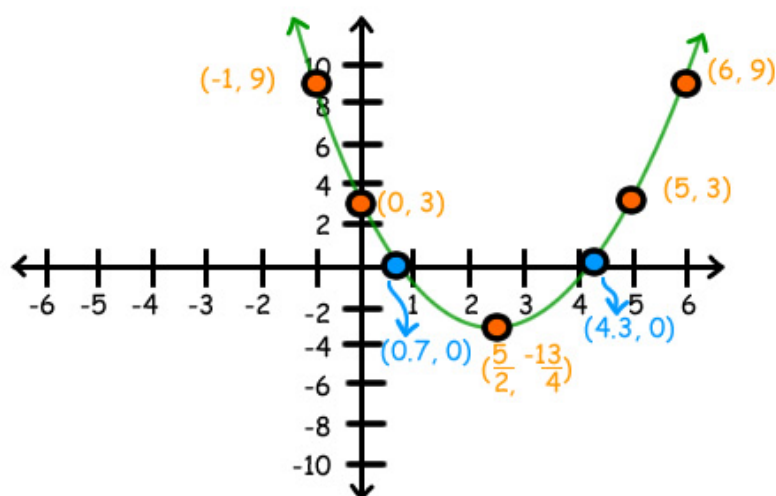
Ask Question ▶

Solve $x^2 - 5x + 3 = 0$ by graphing.

Question

Answer

x	$y = x^2 - 5x + 3$
-1	$y = (-1)^2 - 5(-1) + 3 = 9$
0	$y = (0)^2 - 5(0) + 3 = 3$
$\frac{5}{2}$	$y = (\frac{5}{2})^2 - 5(\frac{5}{2}) + 3 = -\frac{13}{4}$
5	$y = (5)^2 - 5(5) + 3 = 3$
6	$y = (6)^2 - 5(6) + 3 = 9$



$x = 0.7, 4.3$ (Approximate)

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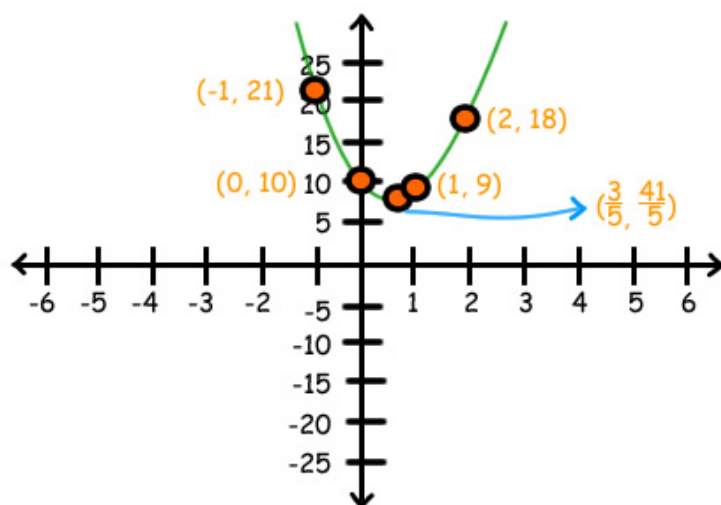
Ask Question ▶

Solve $5x^2 - 6x + 10 = 0$ by graphing.

Question

Answer

x	$y = 5x^2 - 6x + 10$
-1	$y = 5(-1)^2 - 6(-1) + 10 = 21$
0	$y = 5(0)^2 - 6(0) + 10 = 10$
$\frac{3}{5}$	$y = 5(\frac{3}{5})^2 - 6(\frac{3}{5}) + 10 = \frac{41}{5}$
1	$y = 5(1)^2 - 6(1) + 10 = 9$
2	$y = 5(2)^2 - 6(2) + 10 = 18$



No solution

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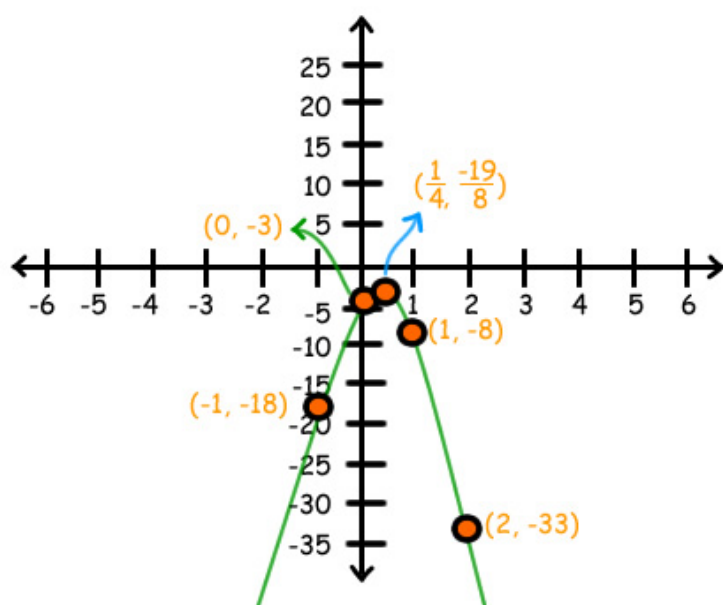
Ask Question ▶

Solve $-10x^2 + 5x - 3 = 0$ by graphing.

Question

Answer

x	$y = -10x^2 + 5x - 3$
-1	$y = -10(-1)^2 + 5(-1) - 3 = -18$
0	$y = -10(0)^2 + 5(0) - 3 = -3$
$\frac{1}{4}$	$y = -10(\frac{1}{4})^2 + 5(\frac{1}{4}) - 3 = -\frac{19}{8}$
1	$y = -10(1)^2 + 5(1) - 3 = -8$
2	$y = -10(2)^2 + 5(2) - 3 = -33$



No solution

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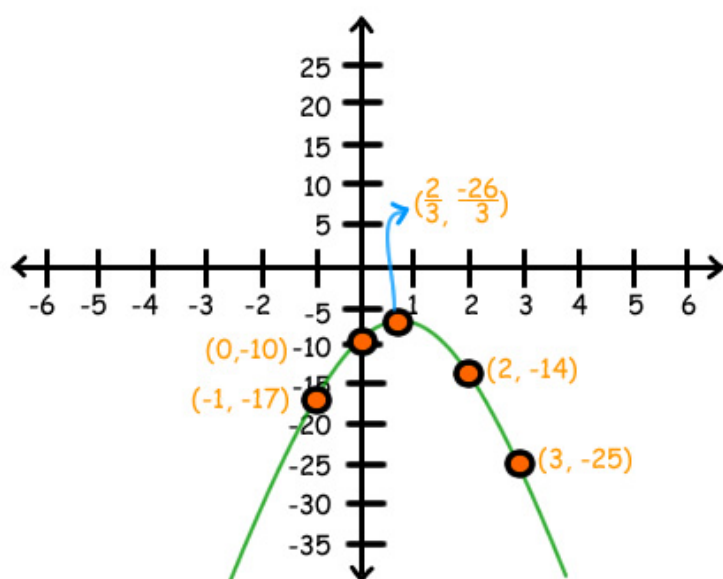
Ask Question ▶

Solve $-3x^2 + 4x - 10 = 0$ by graphing.

Question

Answer

x	$y = -3x^2 + 4x - 10$
-1	$y = -3(-1)^2 + 4(-1) - 10 = -17$
0	$y = -3(0)^2 + 4(0) - 10 = -10$
$\frac{2}{3}$	$y = -3(\frac{2}{3})^2 + 4(\frac{2}{3}) - 10 = -\frac{26}{3}$
2	$y = -3(2)^2 + 4(2) - 10 = -14$
3	$y = -3(3)^2 + 4(3) - 10 = -25$



No solution

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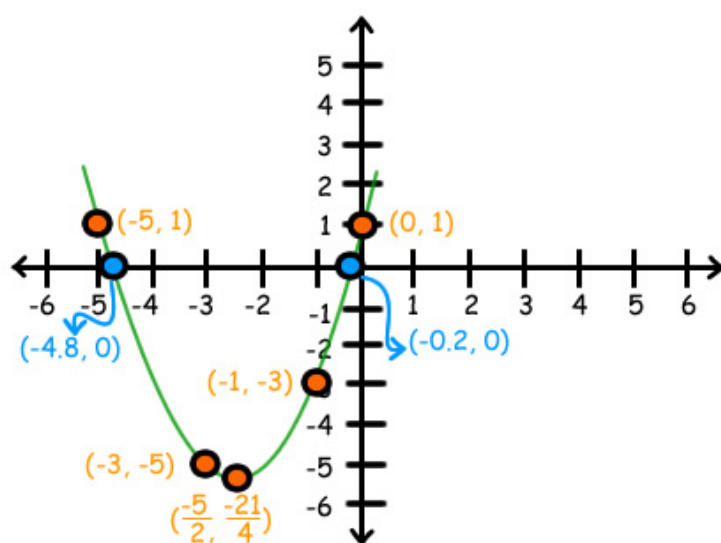
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Solve $x^2 + 5x + 1 = 0$ by graphing.

Question

Answer

x	$y = x^2 + 5x + 1$
-5	$y = (-5)^2 + 5(-5) + 1 = 1$
-3	$y = (-3)^2 + 5(-3) + 1 = -5$
$-\frac{5}{2}$	$y = (-\frac{5}{2})^2 + 5(-\frac{5}{2}) + 1 = -\frac{21}{4}$
-1	$y = (-1)^2 + 5(-1) + 1 = -3$
0	$y = (0)^2 + 5(0) + 1 = 1$



$x = -4.8, -0.2$ (Approximate)

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Solve $x^2 + 4x - 32 = 0$ by factoring.

Question

Answer

$$x^2 + 4x - 32 = 0$$

$$x^2 + bx + c = 0$$

$$c = -32 = 8 \cdot (-4)$$

$$b = 4 = 8 - 4$$

$$x^2 + 8x - 4x - 32 = 0$$

$$x(x + 8) - 4(x + 8) = 0$$

$$(x + 8)(x - 4) = 0$$

$$x + 8 = 0 \quad \text{or} \quad x - 4 = 0$$

$$x + \cancel{8} - \cancel{8} = 0 - 8 \quad \text{or} \quad x - \cancel{4} + \cancel{4} = 0 + 4$$

$$x = -8 \text{ or } x = 4$$

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Solve $x^2 - 3x - 18 = 0$ by factoring.

Question

Answer

$$x^2 - 3x - 18 = 0$$

$$x^2 + bx + c = 0$$

$$c = -18 = (-6) \cdot 3$$

$$b = -3 = -6 + 3$$

$$x^2 - 6x + 3x - 18 = 0$$

$$x(x - 6) + 3(x - 6) = 0$$

$$(x - 6)(x + 3) = 0$$

$$x - 6 = 0 \quad \text{or} \quad x + 3 = 0$$

$$x - \cancel{6} + \cancel{6} = 0 + 6 \quad \text{or} \quad x + \cancel{3} - \cancel{3} = 0 - 3$$

$$x = 6 \text{ or } x = -3$$

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Solve $x^2 + 10x + 21 = 0$ by factoring.

Question

Answer

$$x^2 + 10x + 21 = 0$$

$$x^2 + bx + c = 0$$

$$c = 21 = 7 \cdot 3$$

$$b = 10 = 7 + 3$$

$$x^2 + 7x + 3x + 21 = 0$$

$$x(x + 7) + 3(x + 7) = 0$$

$$(x + 7)(x + 3) = 0$$

$$x + 7 = 0 \quad \text{or} \quad x + 3 = 0$$

$$x + \cancel{7} - \cancel{7} = 0 - 7 \quad \text{or} \quad x + \cancel{3} - \cancel{3} = 0 - 3$$

$$x = -7 \quad \text{or} \quad x = -3$$

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Solve $x^2 - 36 = 0$ by factoring.

Question

Answer

$$x^2 - 36 = 0$$

$$x^2 + bx + c = 0$$

$$c = -36 = 6 \cdot (-6)$$

$$b = 0 = 6 - 6$$

$$x^2 + 6x - 6x - 36 = 0$$

$$x(x + 6) - 6(x + 6) = 0$$

$$(x + 6)(x - 6) = 0$$

$$x + 6 = 0 \quad \text{or} \quad x - 6 = 0$$

$$x + \cancel{6} - \cancel{6} = 0 - 6 \quad \text{or} \quad x - \cancel{6} + \cancel{6} = 0 + 6$$

$$x = -6 \quad \text{or} \quad x = 6$$

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Solve $x^2 - 3x - 10 = 0$ by factoring.

Question

Answer

$$x^2 - 3x - 10 = 0$$

$$x^2 + bx + c = 0$$

$$c = -10 = (-5) \cdot 2$$

$$b = -3 = -5 + 2$$

$$x^2 - 5x + 2x - 10 = 0$$

$$x(x - 5) + 2(x - 5) = 0$$

$$(x - 5)(x + 2) = 0$$

$$x - 5 = 0 \quad \text{or} \quad x + 2 = 0$$

$$x - \cancel{5} + \cancel{5} = 0 + 5 \quad \text{or} \quad x + \cancel{2} - \cancel{2} = 0 - 2$$

$$x = 5 \text{ or } x = -2$$

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Solve $x^2 + 8x + 12 = 0$ by factoring.

Question

Answer

$$x^2 + 8x + 12 = 0$$

$$x^2 + bx + c = 0$$

$$c = 12 = 6 \cdot 2$$

$$b = 8 = 6 + 2$$

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

$$x(x + 6) + 2(x + 6) = 0$$

$$(x + 6)(x + 2) = 0$$

$$x + 6 = 0 \quad \text{or} \quad x + 2 = 0$$

$$x + \cancel{6} - \cancel{6} = 0 - 6 \quad \text{or} \quad x + \cancel{2} - \cancel{2} = 0 - 2$$

$$x = -6 \text{ or } x = -2$$

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Find the vertex of $x^2 + 4x - 32$

Question

Answer

$$y = x^2 + 4x - 32$$

$$y = x^2 + 2(2)(x) + 2^2 - 2^2 - 32$$

$$y = (x + 2)^2 - 4 - 32$$

$$y = [x - (-2)]^2 - 36$$

$$y = a(x - h)^2 + k$$

$$\text{Vertex} = (h, k) = (-2, -36)$$

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Find the vertex of $x^2 - 3x - 18$

Question

Answer

$$y = x^2 - 3x - 18$$

$$y = x^2 - 2\left(\frac{3}{2}\right)x + \left(\frac{3}{2}\right)^2 - \left(\frac{3}{2}\right)^2 - 18$$

$$y = x^2 - 3x + \frac{9}{4} - \frac{9}{4} - 18$$

$$y = \left(x - \frac{3}{2}\right)^2 - \frac{81}{4}$$

$$y = a(x - h)^2 + k$$

$$\text{Vertex} = (h, k) = \left(\frac{3}{2}, -\frac{81}{4}\right)$$

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Find the vertex of $x^2 + 10x + 21$

Question

Answer

$$y = x^2 + 10x + 21$$

$$y = x^2 + 2(5)x + 5^2 - 5^2 + 21$$

$$y = (x + 5)^2 - 25 + 21$$

$$y = [x - (-5)]^2 - 4$$

$$y = a(x - h)^2 + k$$

$$\text{vertex} = (h, k) = (-5, -4)$$

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Find the vertex of $x^2 - 36$

Question

Answer

$$y = x^2 - 36$$

$$y = x^2 + 2(0) \cdot x + 0^2 - 0^2 - 36$$

$$y = (x + 0)^2 - 0 - 36$$

$$y = (x + 0)^2 - 36$$

$$y = a(x - h)^2 + k$$

$$\text{vertex} = (h, k) = (0, -36)$$

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Find the vertex of $x^2 - 3x - 10$

Question

Answer

$$y = x^2 - 3x - 10$$

$$y = x^2 - 2\left(\frac{3}{2}\right)x + \left(\frac{3}{2}\right)^2 - \left(\frac{3}{2}\right)^2 - 10$$

$$y = x^2 - 3x + \frac{9}{4} - \frac{9}{4} - 10$$

$$y = \left(x - \frac{3}{2}\right)^2 - \frac{49}{4}$$

$$y = a(x - h)^2 + k$$

$$\text{Vertex} = (h, k) = \left(\frac{3}{2}, -\frac{49}{4}\right)$$

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Find the vertex of $x^2 + 8x + 12$

Question

Answer

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

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

$$y = (x + 4)^2 - 16 + 12$$

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

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

$$y = a(x - h)^2 - k$$

$$\text{vertex} = (h, k) = (-4, -4)$$

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Solve $x^2 + 3x - 10 = 0$
Using the quadratic formula.

Question

$$x^2 + 3x - 10 = 0$$

$$1 \cdot x^2 + 3x - 10 = 0$$

$$ax^2 + bx + c = 0$$

$$a = 1; b = 3; c = -10$$

Discriminant

$$D = b^2 - 4ac$$

$$= (3)^2 - 4(1)(-10)$$

$$= 9 + 40$$

$$= 49$$

$$\therefore D = 49$$

Answer

$$x = \frac{-b \pm \sqrt{D}}{2a}$$

$$x = \frac{-3 \pm \sqrt{49}}{2(1)}$$

$$x = \frac{-3 \pm 7}{2}$$

$$x = \frac{-3 + 7}{2} \text{ or } \frac{-3 - 7}{2}$$

$$x = \frac{4}{2} \text{ or } x = \frac{-10}{2}$$

$$x = 2 \text{ or } x = -5$$

$$x = -5, 2$$

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Solve $x^2 - 5x + 3 = 0$
Using the quadratic formula.

Question

$$x^2 - 5x + 3 = 0$$

$$1 \cdot x^2 - 5x + 3 = 0$$

$$ax^2 + bx + c = 0$$

$$a = 1; b = -5; c = 3$$

Discriminant

$$D = b^2 - 4ac$$

$$= (-5)^2 - 4(1)(3)$$

$$= 25 - 12$$

$$= 13$$

$$\therefore D = 13$$

Answer

$$x = \frac{-b \pm \sqrt{D}}{2a}$$

$$x = \frac{-(-5) \pm \sqrt{13}}{2(1)}$$

$$x = \frac{5 \pm \sqrt{13}}{2}$$

$$x = \frac{5 + \sqrt{13}}{2} \text{ or } \frac{5 - \sqrt{13}}{2}$$

$$x = \frac{5 + \sqrt{13}}{2}, \frac{5 - \sqrt{13}}{2}$$

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Solve $5x^2 - 6x + 10 = 0$
Using the quadratic formula.

Question

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

$$ax^2 + bx + c = 0$$

$$a = 5; b = -6; c = 10$$

Discriminant

$$D = b^2 - 4ac$$

$$= (-6)^2 - 4(5)(10)$$

$$= 36 - 200$$

$$= -164 < 0$$

∴ No Solution

Answer

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Questions?
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Solve $-10x^2 + 5x - 3 = 0$
Using the quadratic formula.

Question

$$-10x^2 + 5x - 3 = 0$$

$$ax^2 + bx + c = 0$$

$$a = -10; b = 5; c = -3$$

Discriminant

$$D = b^2 - 4ac$$

$$= (5)^2 - 4(-10)(-3)$$

$$= 25 - 120$$

$$= -95 < 0$$

∴ No Solution

Answer

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Questions?
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Solve $-3x^2 + 4x - 10 = 0$
Using the quadratic formula.

Question

$$-3x^2 + 4x - 10 = 0$$

$$ax^2 + bx + c = 0$$

$$a = -3; b = 4; c = -10$$

Discriminant

$$D = b^2 - 4ac$$

$$= (4)^2 - 4(-3)(-10)$$

$$= 16 - 120$$

$$= -104 < 0$$

∴ No Solution

Answer

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Solve $x^2 + 4x - 32 = 0$
Using the quadratic formula.

Question

$$x^2 + 4x - 32 = 0$$

$$1 \cdot x^2 + 4x - 32 = 0$$

$$ax^2 + bx + c = 0$$

$$a = 1; b = 4; c = -32$$

Discriminant

$$D = b^2 - 4ac$$

$$= (4)^2 - 4(1)(-32)$$

$$= 16 + 128$$

$$= 144$$

$$\therefore D = 144$$

Answer

$$x = \frac{-b \pm \sqrt{D}}{2a}$$

$$x = \frac{-4 \pm \sqrt{144}}{2(1)}$$

$$x = \frac{-4 \pm 12}{2}$$

$$x = \frac{-4 + 12}{2} \text{ or } \frac{-4 - 12}{2}$$

$$x = \frac{8}{2} \text{ or } x = \frac{-16}{2}$$

$$x = 4 \text{ or } x = -8$$

$$x = -8, 4$$

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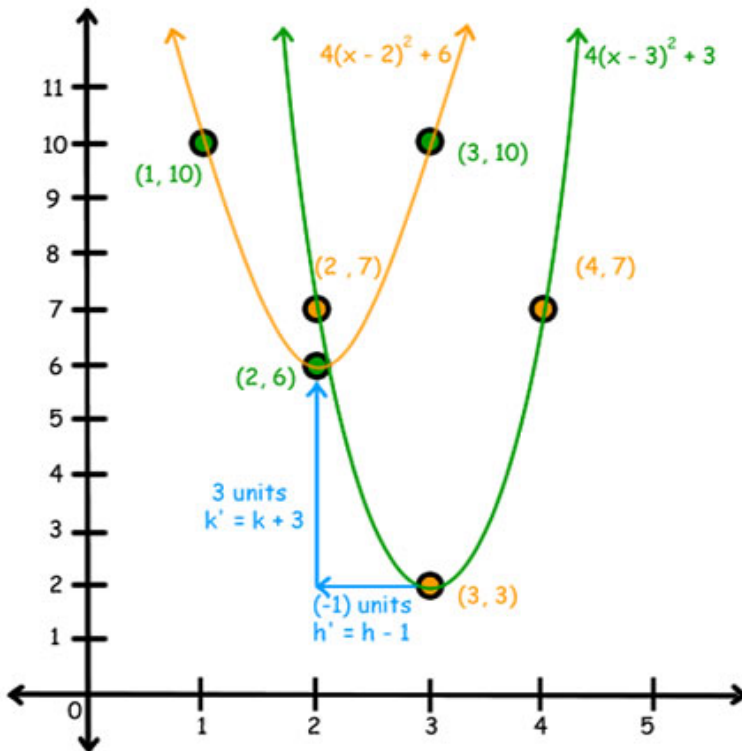


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Ask Question ▶

Move the parabola $4(x - 3)^2 + 3$,
3 units up and 1 unit left.

Question



Answer

$$4(x - 3)^2 + 3$$

$$a(x - h)^2 + k$$

$$a = 4; h = 3; k = 3$$

$$a' = a = 4$$

$$h' = h - 1 = 3 - 1 = 2$$

$$k' = k + 3 = 3 + 3 = 6$$

Transformed Parabola:

$$a'(x - h')^2 + k'$$

$$4(x - 2)^2 + 6$$

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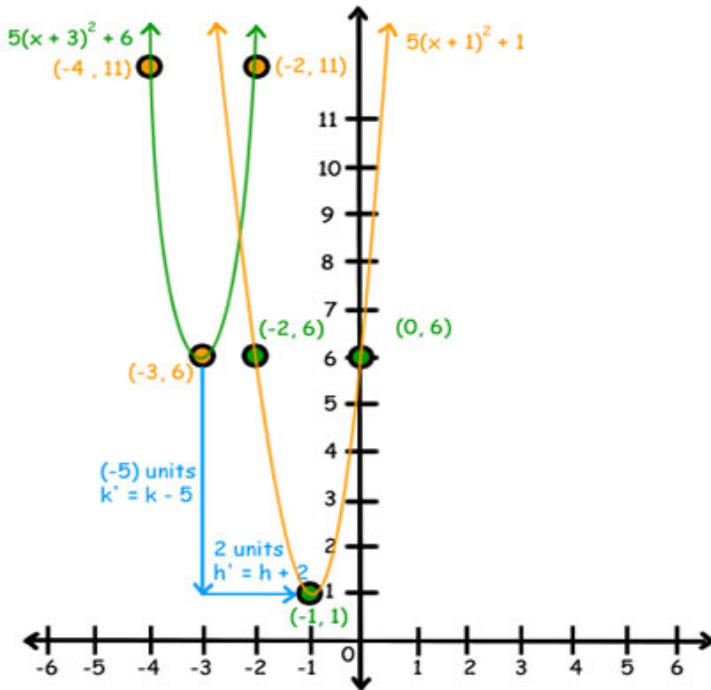
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Ask Question ▶

Move the parabola $5(x + 3)^2 + 6$,
5 units down and 2 unit right.

Question

Answer



$$5(x + 3)^2 + 6$$

$$5(x - (-3))^2 + 6$$

$$a(x - h)^2 + k$$

$$a = 5; h = -3; k = 6$$

$$a' = a = 5$$

$$h' = h + 2 = -3 + 2 = -1$$

$$k' = k - 5 = 6 - 5 = 1$$

Transformed Parabola:

$$a'(x - h')^2 + k'$$

$$5(x - (-1))^2 + 1$$

$$\boxed{5(x + 1)^2 + 1}$$

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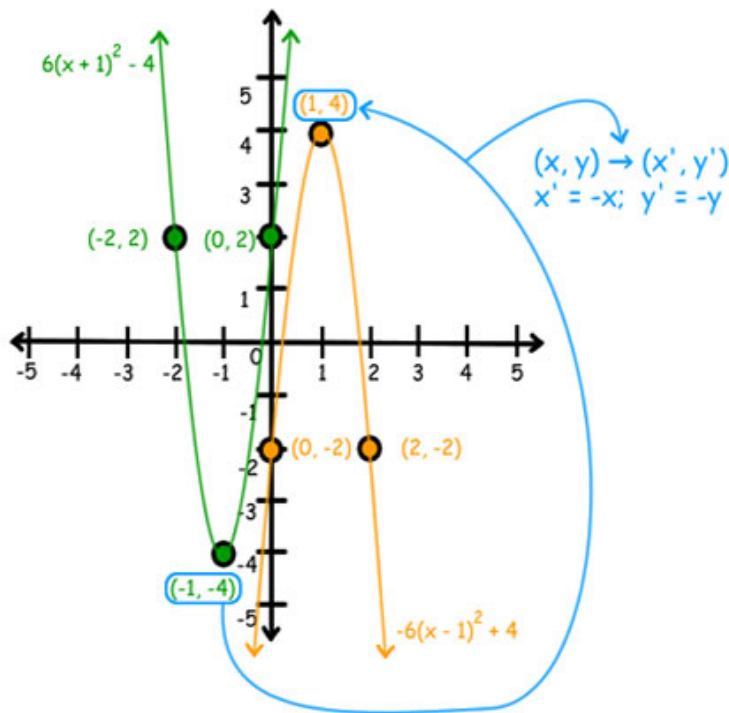


Questions?
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Ask Question ▶

Find the mirror image of $6(x + 1)^2 - 4$,
by the x and y axis

Question



Answer

$$6(x + 1)^2 - 4$$

$$6(x - (-1))^2 - 4$$

$$a(x - h)^2 + k$$

$$a = 6; h = -1; k = -4$$

Reflection on X-axis: $\begin{cases} a' = -a = -6 \\ k' = -k = -(-4) = 4 \end{cases}$

Reflection on Y-axis: $h' = -h = -(-1) = 1$

Transformed Parabola:

$$a'(x - h')^2 + k'$$

$$-6(x - 1)^2 + 4$$

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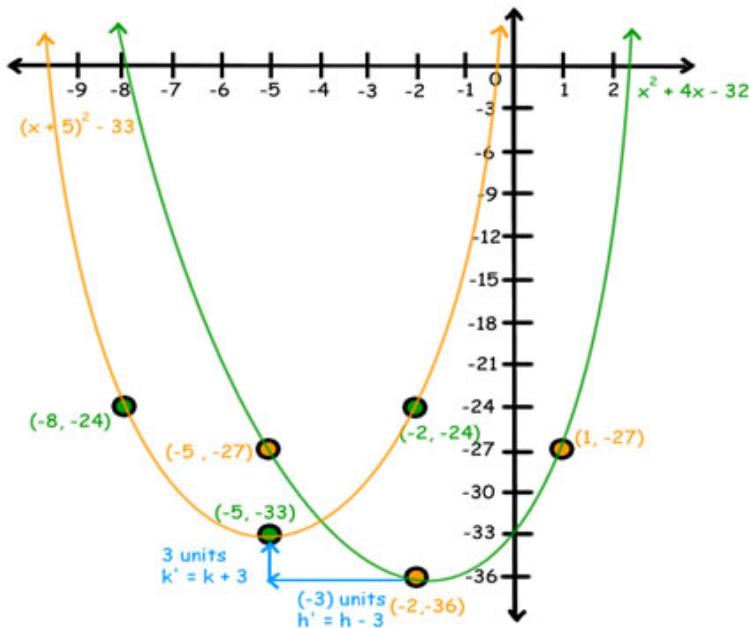
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Ask Question ▶

Move the parabola $x^2 + 4x - 32$,
3 units up and 3 units left.

Question

Answer



$$x^2 + 4x - 32$$

$$x^2 + 4x + 4 - 4 - 32$$

$$(x + 2)^2 - 36$$

$$1 \cdot (x - (-2))^2 - 36$$

$$a(x - h)^2 + k$$

$$a = 1; h = -2; k = -36$$

$$a' = a = 1$$

$$h' = h - 3 = -2 - 3 = -5$$

$$k' = k + 3 = -36 + 3 = -33$$

Transformed Parabola:

$$a'(x - h')^2 + k'$$

$$1 \cdot (x - (-5))^2 - 33$$

$$(x + 5)^2 - 33$$

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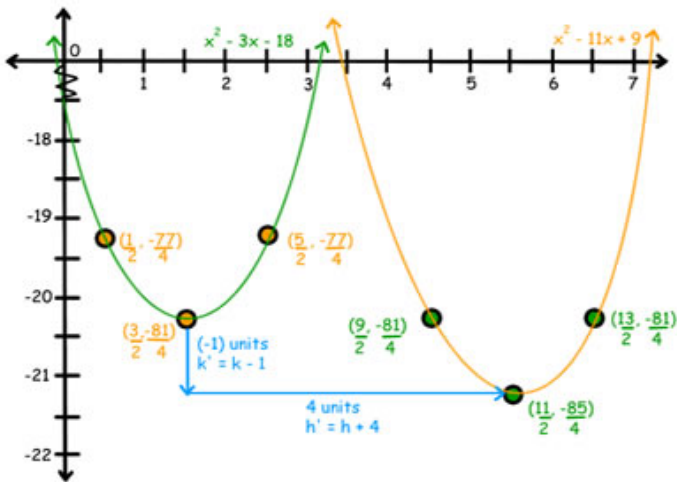


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Ask Question ▶

Move the parabola $x^2 - 3x - 18$,
1 units down and 4 units right.

Question



Answer

$$x^2 - 3x - 18$$

$$x^2 - 3x + \frac{9}{4} - \frac{9}{4} - 18$$

$$(x - \frac{3}{2})^2 - \frac{9}{4} + \frac{72}{4}$$

$$1 \cdot (x - \frac{3}{2})^2 - \frac{81}{4}$$

$$a(x - h)^2 + k$$

$$a = 1; h = \frac{3}{2}; k = -\frac{81}{4}$$

$$a' = a = 1$$

$$h' = h + 4 = \frac{3}{2} + 4 = \frac{11}{2}$$

$$k' = k - 1 = -\frac{81}{4} - 1 = -\frac{85}{4}$$

Transformed Parabola:

$$a'(x - h')^2 + k'$$

$$1 \cdot (x - \frac{11}{2})^2 - \frac{85}{4}$$

$$(x - \frac{11}{2})^2 - \frac{85}{4}$$

$$x^2 - 11x + \frac{121}{4} - \frac{85}{4}$$

$$x^2 - 11x + \frac{36}{4}$$

$$x^2 - 11x + 9$$

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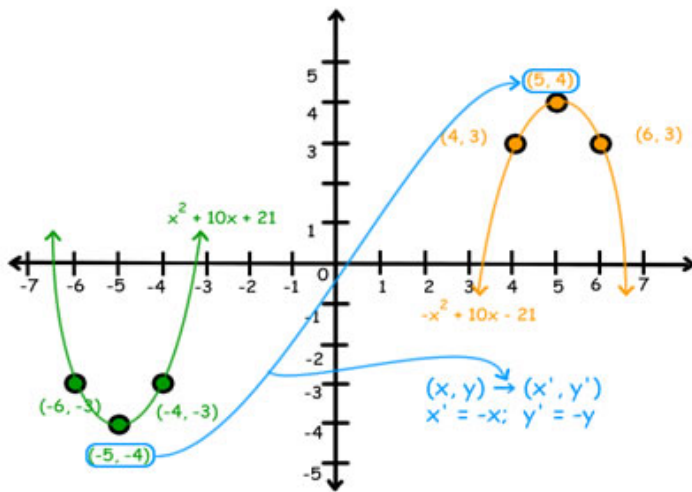
Questions?
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Ask Question



Find the mirror image of $x^2 + 10x + 21$,
by the x and y axis

Question



Answer

$$x^2 + 10x + 21$$

$$x^2 + 10x + 25 - 25 + 21$$

$$(x + 5)^2 - 4$$

$$1 \cdot (x - (-5))^2 - 4$$

$$a(x - h)^2 + k$$

$$a = 1; h = -5; k = -4$$

$$\text{Reflection on X-axis: } \begin{cases} a' = -a = -1 \\ k' = -k = -(-4) = 4 \end{cases}$$

$$\text{Reflection on Y-axis: } h' = -h = -(-5) = 5$$

Transformed Parabola:

$$a'(x - h')^2 + k'$$

$$-1 \cdot (x - 5)^2 + 4$$

$$-(x^2 - 10x + 25) + 4$$

$$-x^2 + 10x - 25 + 4$$

$$-x^2 + 10x - 21$$

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