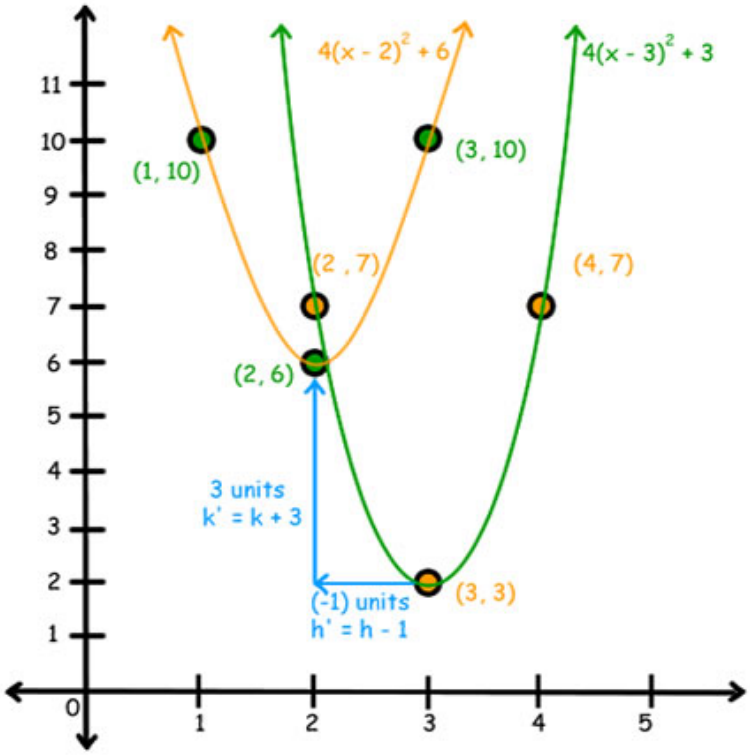
Problem 1 of 6

Question

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

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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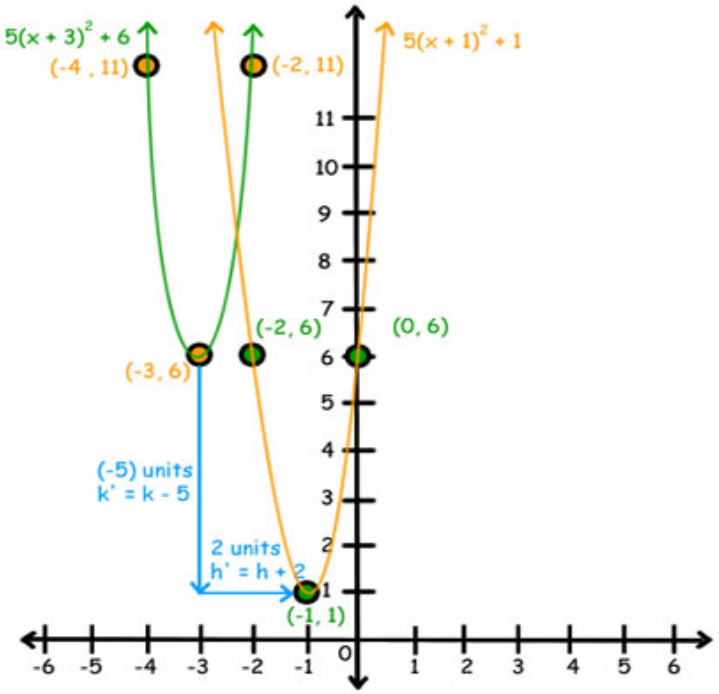
Problem 2 of 6

Question

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

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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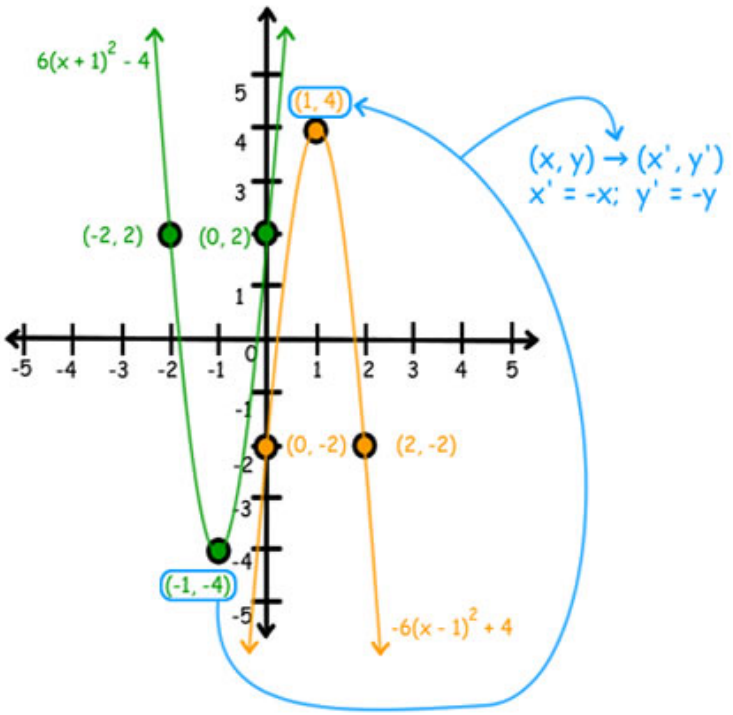
Problem 3 of 6

Question

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

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: $a' = -a = -6$; $k' = -k = -(-4) = 4$

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

Transformed Parabola:

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

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

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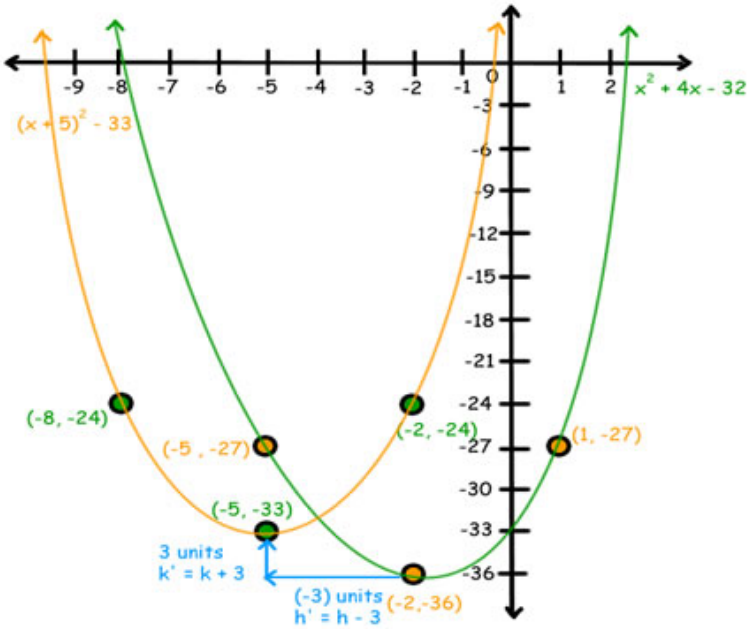
Problem 4 of 6

Question

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

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:

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

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

$\boxed{(x + 5)^2 - 33}$

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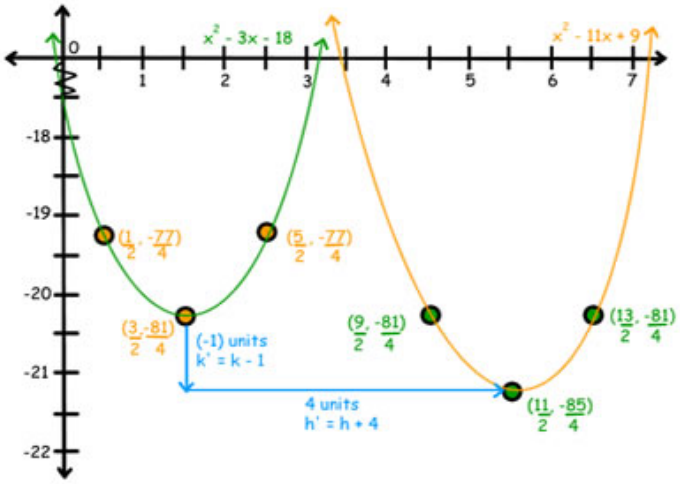
Problem 5 of 6

Question

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

Answer



$x^2 - 3x - 18$

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

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

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

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

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

$a' = a = 1$

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

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

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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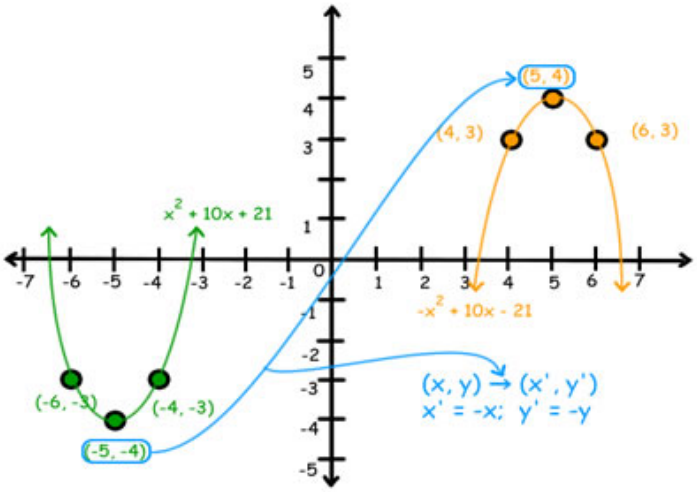
Problem 6 of 6

Question

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

Answer



$x^2 + 10x + 21$

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

$(x + 5)^2 - 4$

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

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

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

Reflection on X-axis: $a' = -a = -1$; $k' = -k = -(-4) = 4$

Reflection on Y-axis: $h' = -h = -(-5) = 5$

Transformed Parabola:

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

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

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

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

$\boxed{-x^2 + 10x - 21}$

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