6.3 Completing the Square

NOTES

Write your questions here!

SQUA E

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

x^2+6x+9 $x^2-14x+49$

$x^2+6x+9=100$ $x^2-14x+49=5$

$x^2+4x+?$ $x^2-16x+?$

$x^2-12x+5=0$

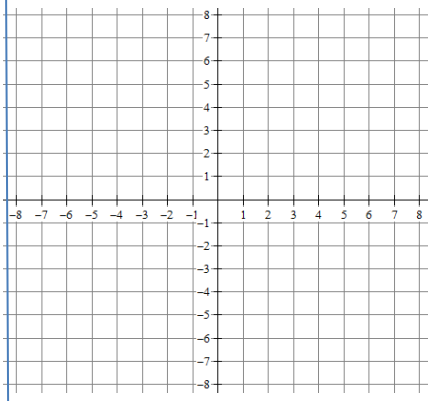
To complete the square of the expression x^2+bx,

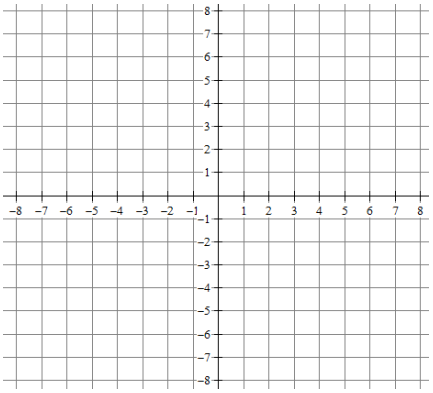
$2x^2+12x+30=0$ $x^2-5x=$

VERTEX FORM

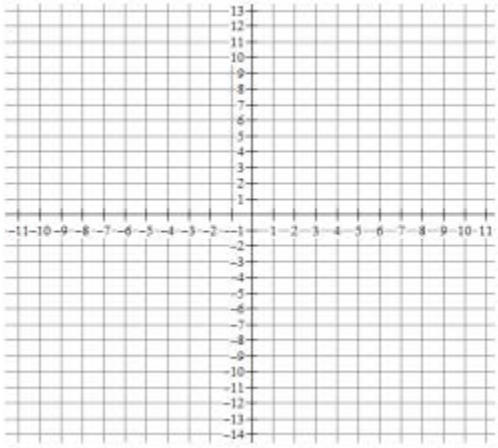
Write in vertex form. Find the roots. Graph it!

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





$y = 2x^2 + 16x + 20$



SUMMARY:

Now, summarize your notes here!

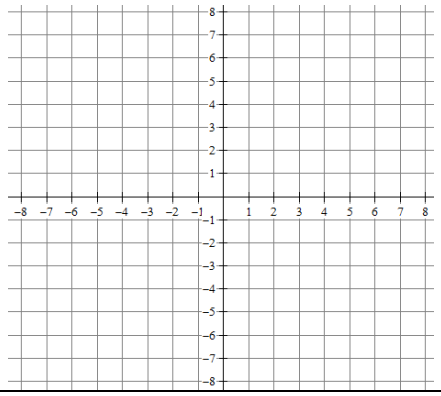
6.3 Completing the Square

PRACTICE

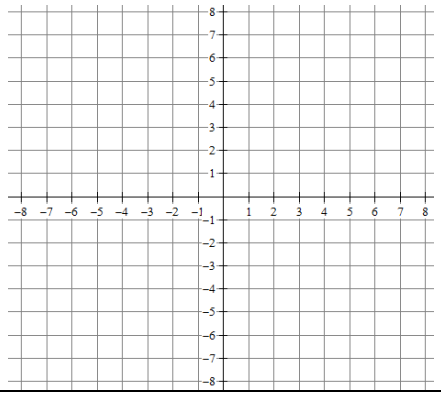
Fill in the question mark so that the expression makes a perfect square trinomial. Then write the expression as the perfect square.		
1. $x^2 + 24x + ?$	2. $x^2 - 20x + ?$	3. $x^2 + 30x + ?$
4. $x^2 + 7x + ?$	5. $x^2 - 13x + ?$	6. $x^2 + x + ?$
Solve the equation by completing the square.		
7. $x^2 + 4x = 10$	8. $x^2 - 12x + 48 = 0$	9. $x^2 + 8x - 14 = 0$
10. $x^2 + 16x = 20$	11. $3x^2 + 36x + 162 = 0$	12. $x^2 + 5x + 9 = 0$
Write the quadratic function in vertex form.		
13. $y = x^2 - 18x + 7$	14. $y = 2x^2 + 24x + 9$	15. $f(x) = -x^2 - 9x + 8$

Write the quadratic function in vertex form. Find the roots. Graph it! Label the vertex and roots.

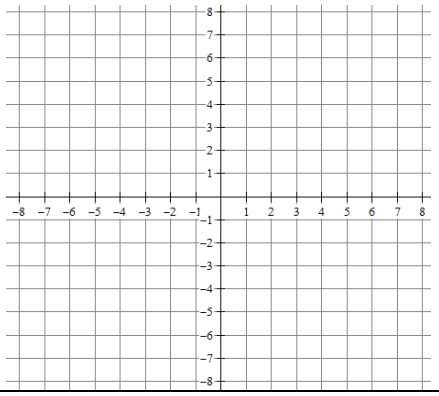
16. $y = x^2 - 6x + 4$



17. $y = 2x^2 + 12x + 10$



18. $y = -x^2 + 10x - 22$

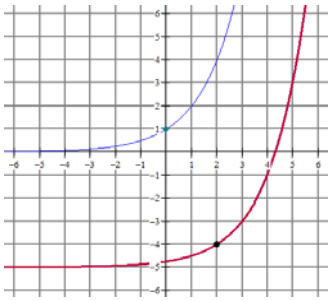


Algebra Skillz

GRAPH

Below, the graph of $f(x) = 2^{(x-2)} - 5$ is sketched in bold. Its parent function $f(x) = 2^x$ is represented by the thin curve.

1. Describe the translation of the parent graph.



2. How does the translation relate to the equation?

SIMPLIFY

3. $2\sqrt{32} + 4\sqrt{18}$

4. $4\sqrt{3}(5 + \sqrt{7})$

SOLVE

5. Solve:
$(3x + 1)(5x - 8) = 0$

6. Factor and solve.
$x^2 - 36 = 0$

APPLICATION

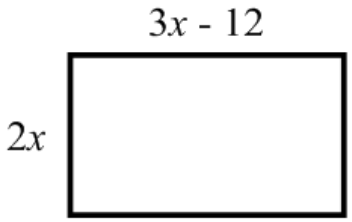
Solve the equation by completing the square.

1. $x^2 + 8x = -12$

Write the quadratic function in vertex form.

2. $y = 2x^2 - 40x + 17$

3. The area of the rectangle is 76 m^2. Find *x*.



4. A bottle rocket is shot straight into air. The height of the rocket in feet t seconds after lift is given by this function:

$$f(t) = -16t^2 + 160t + 32$$

a. Find the maximum height of the rocket.

b. When does the rocket hit the ground?

5. **SAT PREP** Imaginary numbers are NOT on the SAT. For this Unit we will look at "Mr. Kelly Problems". They are called Kelly Problems because they look weird and are confusing. Don't freak out about these, once you get the hang of them they are pretty easy.

MULITPLE CHOICE

If $\lessgtr h \lessgtr = h - 2h^2$, then find $\lessgtr 3 \lessgtr$.

(A) -18
(B) -9
(C) -15
(D) -33
(E) 9

GRID IN

$x \circledast y = 3x - y$. If $4 \circledast 9 = k \circledast 12$, find the value of *k*.