

## Factoring Trinomials (a = 1)

**Factor each completely.**

1)  $b^2 + 8b + 7$

2)  $n^2 - 11n + 10$

3)  $m^2 + m - 90$

4)  $n^2 + 4n - 12$

5)  $n^2 - 10n + 9$

6)  $b^2 + 16b + 64$

7)  $m^2 + 2m - 24$

8)  $x^2 - 4x + 24$

9)  $k^2 - 13k + 40$

10)  $a^2 + 11a + 18$

11)  $n^2 - n - 56$

12)  $n^2 - 5n + 6$

13)  $b^2 - 6b + 8$

14)  $n^2 + 6n + 8$

15)  $2n^2 + 6n - 108$

16)  $5n^2 + 10n + 20$

17)  $2k^2 + 22k + 60$

18)  $a^2 - a - 90$

19)  $p^2 + 11p + 10$

20)  $5v^2 - 30v + 40$

21)  $2p^2 + 2p - 4$

22)  $4v^2 - 4v - 8$

23)  $x^2 - 15x + 50$

24)  $v^2 - 7v + 10$

25)  $p^2 + 3p - 18$

26)  $6v^2 + 66v + 60$

## Factoring Trinomials (a = 1)

**Factor each completely.**

1)  $b^2 + 8b + 7$

$(b + 7)(b + 1)$

2)  $n^2 - 11n + 10$

$(n - 10)(n - 1)$

3)  $m^2 + m - 90$

$(m - 9)(m + 10)$

4)  $n^2 + 4n - 12$

$(n - 2)(n + 6)$

5)  $n^2 - 10n + 9$

$(n - 1)(n - 9)$

6)  $b^2 + 16b + 64$

$(b + 8)^2$

7)  $m^2 + 2m - 24$

$(m + 6)(m - 4)$

8)  $x^2 - 4x + 24$

Not factorable

9)  $k^2 - 13k + 40$

$(k - 5)(k - 8)$

10)  $a^2 + 11a + 18$

$(a + 2)(a + 9)$

11)  $n^2 - n - 56$

$(n + 7)(n - 8)$

12)  $n^2 - 5n + 6$

$(n - 2)(n - 3)$

$$13) b^2 - 6b + 8$$
$$(b - 4)(b - 2)$$

$$14) n^2 + 6n + 8$$
$$(n + 2)(n + 4)$$

$$15) 2n^2 + 6n - 108$$
$$2(n + 9)(n - 6)$$

$$16) 5n^2 + 10n + 20$$
$$5(n^2 + 2n + 4)$$

$$17) 2k^2 + 22k + 60$$
$$2(k + 5)(k + 6)$$

$$18) a^2 - a - 90$$
$$(a - 10)(a + 9)$$

$$19) p^2 + 11p + 10$$
$$(p + 10)(p + 1)$$

$$20) 5v^2 - 30v + 40$$
$$5(v - 2)(v - 4)$$

$$21) 2p^2 + 2p - 4$$
$$2(p - 1)(p + 2)$$

$$22) 4v^2 - 4v - 8$$
$$4(v + 1)(v - 2)$$

$$23) x^2 - 15x + 50$$
$$(x - 10)(x - 5)$$

$$24) v^2 - 7v + 10$$
$$(v - 5)(v - 2)$$

$$25) p^2 + 3p - 18$$
$$(p - 3)(p + 6)$$

$$26) 6v^2 + 66v + 60$$
$$6(v + 10)(v + 1)$$

Geometry  
Graphing Factored Form

Factor each polynomial. Once you have factored the polynomial, graph the polynomial.

1.  $y = v^2 - 4v - 5$

2.  $y = x^2 + 9x - 10$

3.  $y = x^2 - 23x + 112$

4.  $y = a^2 - 3a - 18$

5.  $y = x^2 + 22x + 96$

6.  $y = b^2 + 16b - 80$

7.  $y = v^2 - 5v - 66$

8.  $y = x^2 - 5x - 24$

9.  $y = k^2 - 10k + 16$

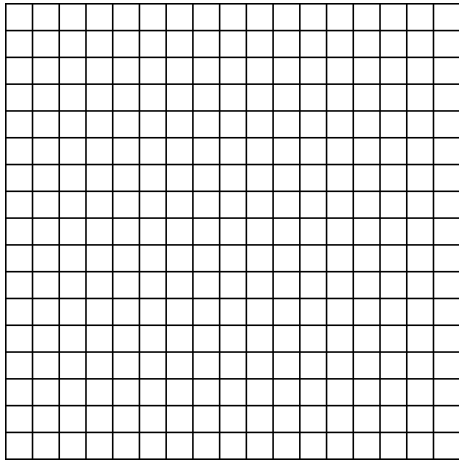
10.  $y = n^2 + 16n + 28$

11.  $y = n^2 + 18n + 32$

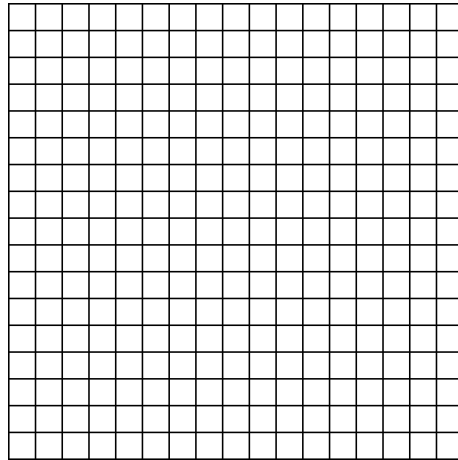
12.  $y = n^2 - 4n - 140$

Answers:

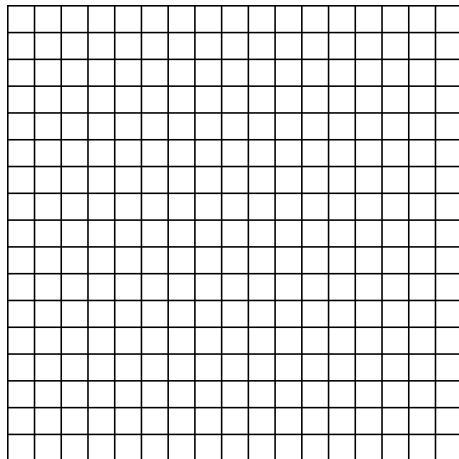
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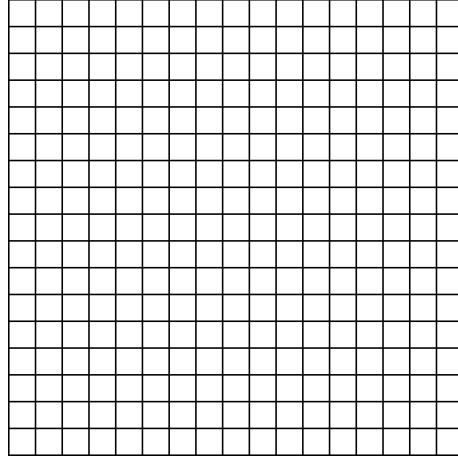
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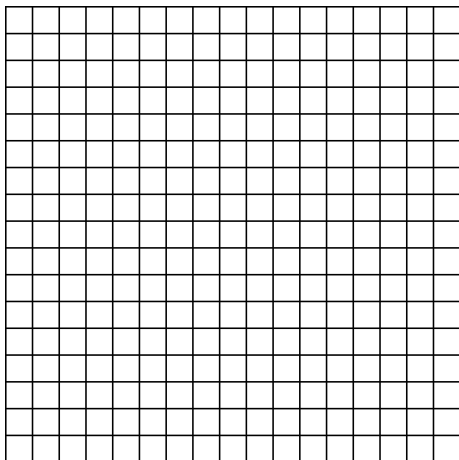
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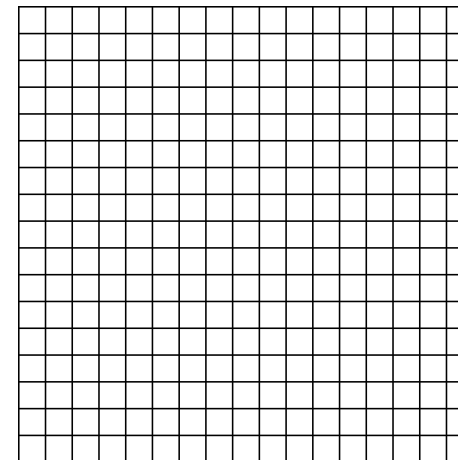
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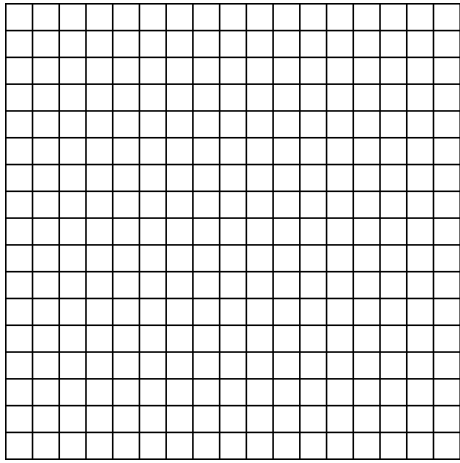
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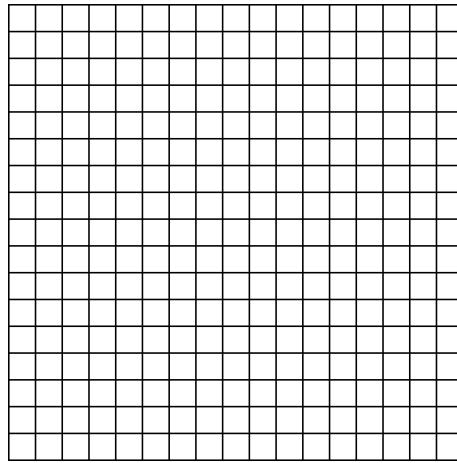
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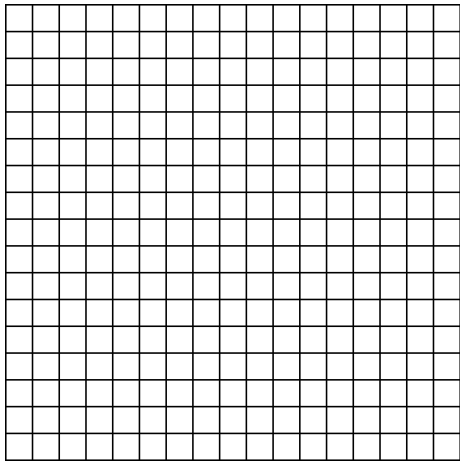
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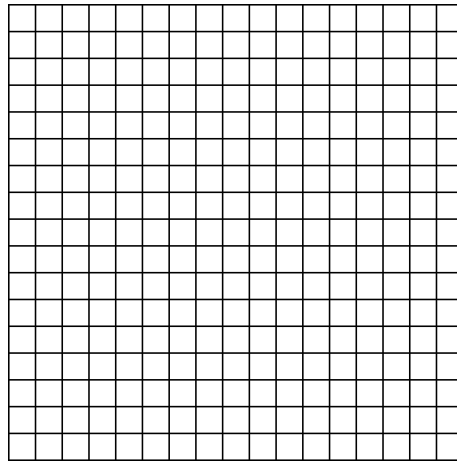
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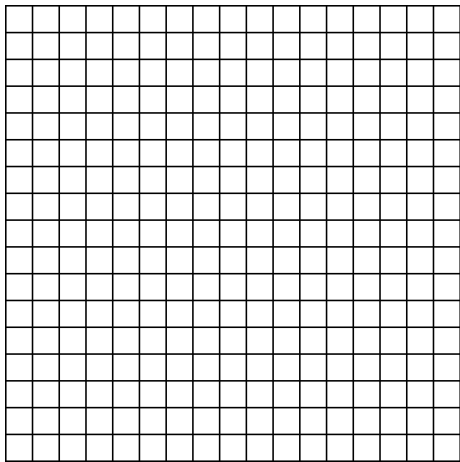
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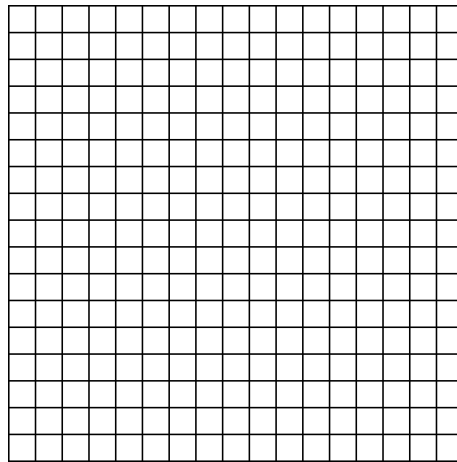
10.



11.



12.



Geometry  
Completing the Square

Name: \_\_\_\_\_  
Period: \_\_\_\_\_

Rewrite in vertex form by completing the square.

1.  $f(x) = x^2 - 16x + 6$

2.  $f(x) = x^2 + 2x + 8$

3.  $f(x) = x^2 - 20x + 4$

4.  $f(x) = x^2 + 12x - 9$

5.  $f(x) = x^2 - 32x + 100$

6.  $f(x) = x^2 + 50x - 3$

7.  $f(x) = x^2 + 4x - 6$

8.  $f(x) = x^2 - 6x - 13$

Solve by completing the square.

9.  $x^2 - 8x = 65$

10.  $c^2 - 12c = -38$

11.  $a^2 + 16 = -10a$

12.  $m^2 = -20m - 64$

13.  $b^2 - 18b + 47 = -10$

14.  $h^2 + 14h + 3 = 4$

Geometry  
Graphing by Completing the Square

Complete the square for each polynomial. Once you have completed the square, graph the polynomial.

1.  $v^2 + 14v - 38 = y$

2.  $v^2 + 6v - 59 = y$

3.  $x^2 + 14x - 51 = y$

4.  $x^2 - 12x + 11 = y$

5.  $x^2 + 6x + 8 = y$

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

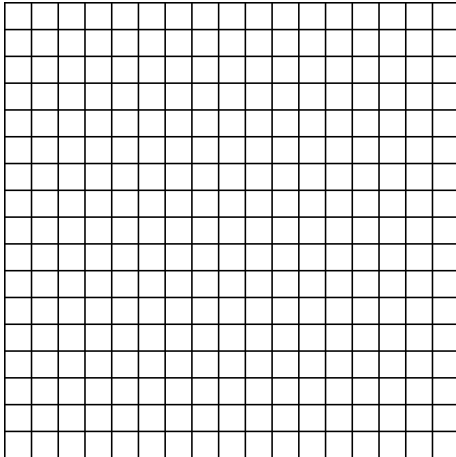
7.  $x^2 + 14x - 15 = y$

8.  $x^2 - 5x + 10 = y$

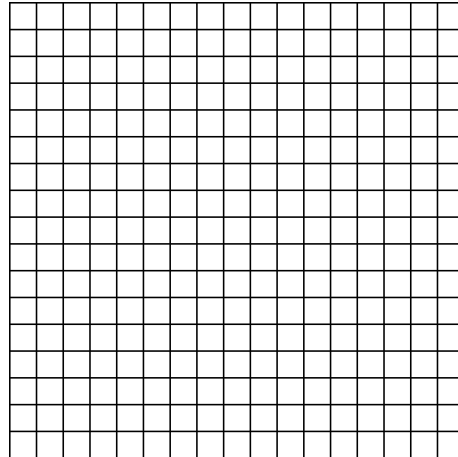
9.  $x^2 + 3x - 5 = y$

Answers:

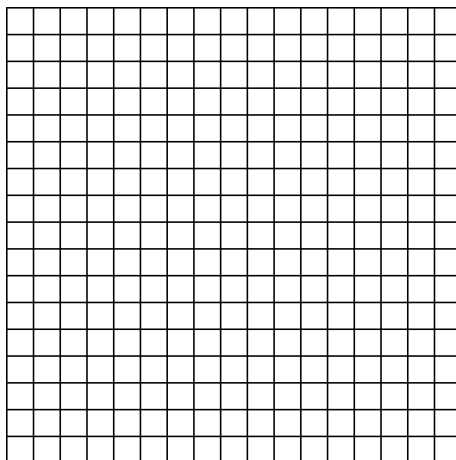
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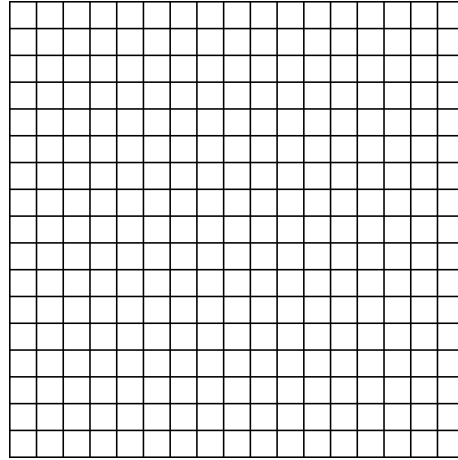
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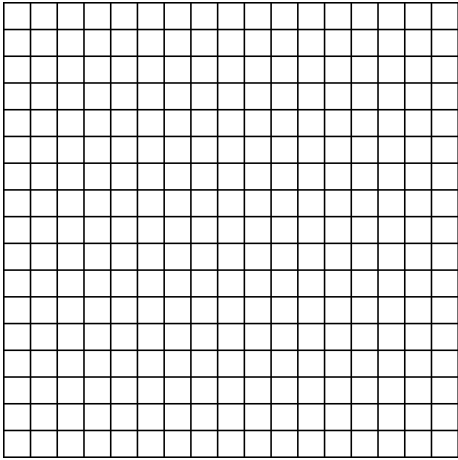


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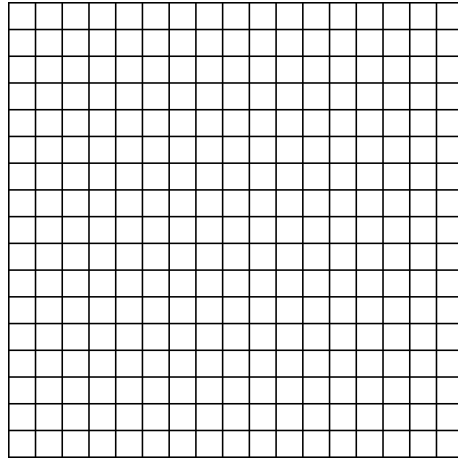




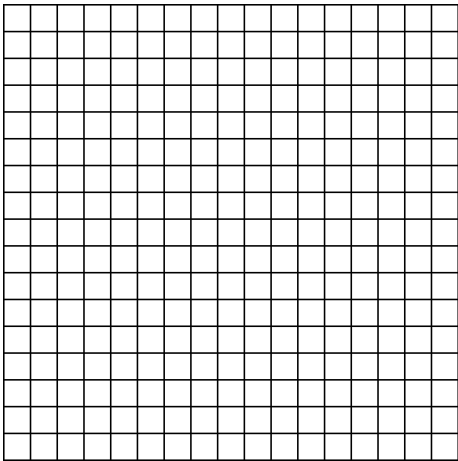
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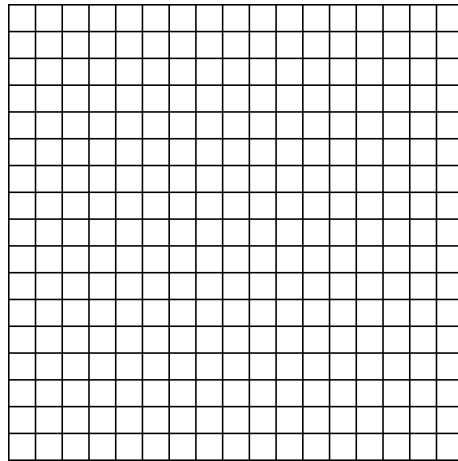
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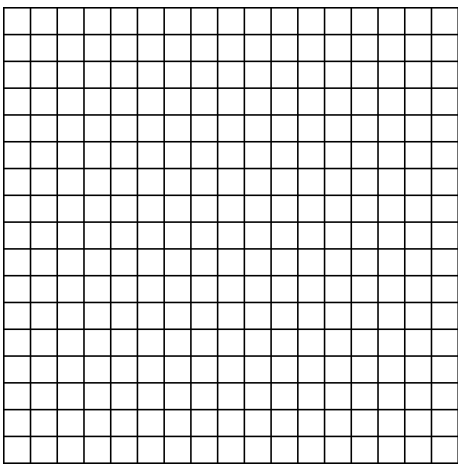
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8.



9.



**Solve each quadratic function...**

**...by factoring.**

1.  $(k+1)(k-5) = 0$

2.  $(a+1)(a+2) = 0$

3.  $x^2 - 11x + 19 = -5$

4.  $n^2 + 7n + 15 = 5$

**...by taking the square root. Write your solution(s) in simplified radical form.**

5.  $k^2 = 76$

6.  $m^2 = 16$

7.  $x^2 + 8 = 28$

8.  $2b^2 = -144$

**...by completing the square. Write your solution(s) in simplified radical form.**

9.  $a^2 + 2a - 3 = 0$

10.  $a^2 - 2a - 8 = 0$

11.  $p^2 + 16p - 22 = 0$

12.  $k^2 + 8k + 12 = 0$

## Forms of Quadratic Functions

### Standard Form

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

OR

$$f(x) = ax^2 + bx + c$$

This form allows you to quickly see the y-intercept.

Y-int: (0, c)

### Factored Form

$$y = (x + a)(x + b)$$

OR

$$f(x) = (x - a)(x - b)$$

This form shows you the x-intercepts.

X-ints: (a, 0), (b, 0)

### Vertex Form

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

OR

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

This form shows the coordinates of the vertex.

Vertex: (h, k)

Use this function for problems 1 - 10:  $y = (x - 2)^2 - 1$

- 1) Give the coordinates of the vertex of the graph.
- 2) Convert the function to standard form.
- 3) Give the coordinates of the y-intercept.
- 4) Convert the function to factored form.
- 5) Give the coordinates of the x-intercepts.
- 6) Graph the function labeling the vertex, y-intercept, and x-intercepts.
- 7) Enter the function on your calculator in vertex form and graph it. How does it compare to your graph?
- 8) Enter the function on your calculator in standard form and graph it. How does it compare to your graph?
- 9) Enter the function on your calculator in factored form and graph it. How does it compare to your graph?
- 10) Use your calculator to find the vertex, x-intercepts, and y-intercept. Do they match yours?

Give the vertex of each function, and graph it. How does vertex form compare to the other forms in each problem?

11)  $y = (x - 3)^2 - 2$

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

13)  $y = x^2 + 3$

14)  $y = -x^2 - 3$

Convert each function to standard form. Give the vertex and y-intercept. Graph. Check your work on the calc.

15)  $y = (x + 4)^2 - 5$

16)  $f(x) = (x - 2)^2 + 3$

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

18)  $f(x) = (x + 3)^2 - 1$

Convert each function to factored form. Give the x and y intercepts. Graph. Show the line of symmetry.

19)  $y = x^2 - 4x - 5$

20)  $y = x^2 + 6x$

21)  $f(x) = x^2 + 2x - 8$

22)  $y = x^2 - 6x - 7$

Convert each function to standard form. Give the x and y intercepts. Graph. Show the line of symmetry.

23)  $f(x) = (x + 2)(x - 3)$       24)  $f(x) = (x - 4)(x - 2)$       25)  $y = (x + 5)(x - 1)$       26)  $f(x) = (x + 3)(x + 4)$

Convert each function to vertex form by completing the square.

27)  $x^2 + 6x = y$       28)  $y = d^2 + 10d$       29)  $y = f^2 + 8f$       30)  $h^2 + 12h = y$

31)  $h^2 + 6h + 5 = y$       32)  $y = x^2 + 10x + 9$       33)  $y = k^2 + 8k + 12$       34)  $x^2 + 12x + 27 = y$

Convert each function to vertex form. Give the vertex and y intercept. Graph. Check your work on the calc.

35)  $y = x^2 + 6x + 8$       36)  $y = x^2 + 10x + 21$       37)  $y = x^2 + 2z$       38)  $f(x) = x^2 + 8x + 7$

Given the roots (zeroes) of a quadratic function, write the function in factored and standard forms. Graph.

39)  $x = -3, 5$       40)  $x = 3, -1$       41)  $x = 3, \text{ multiplicity} = 2$       42)  $x = -2, -6$

43)  $x = 0, -4$       44)  $x = -1, \text{ multiplicity} = 2$       45)  $x = 0, 7$       46)  $x = -1, 8$

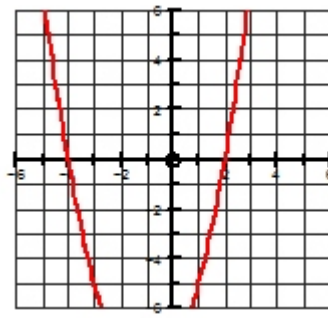
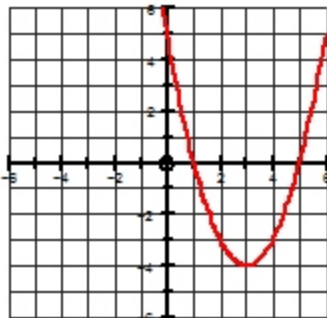
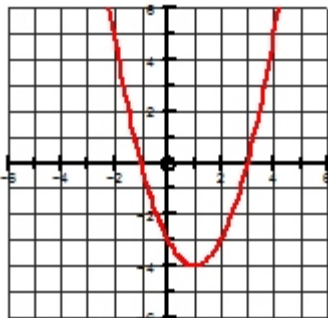
Given the x-intercepts of a quadratic graph write the function in factored and standard forms. Graph.

47)  $(-4, 0), (4, 0)$       48)  $(-1, 0), (5, 0)$       49)  $(-1, 0), (1, 0)$       50)  $(2, 0), (-6, 0)$

51)  $(0, 0), (5, 0)$       52)  $(-3, 0), (0, 0)$       53)  $(-3, 0)$       54)  $(2, 0)$

Given the graph of a function write the equation in factored and standard form.

55)      56)      57)      58)



Given the vertex of a quadratic graph write the function in vertex and standard forms. Graph.

59)  $(-3, -2)$

60)  $(2, 2)$

61)  $(4, -1)$

62)  $(-1, -9)$

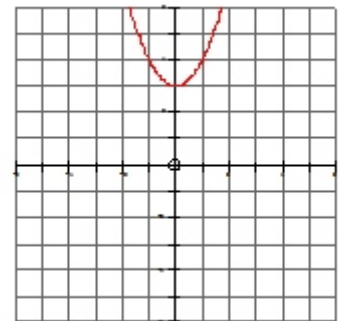
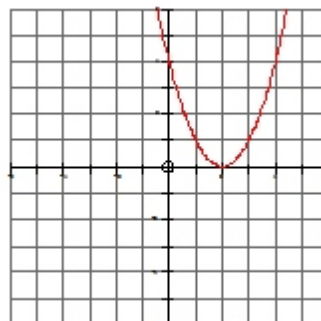
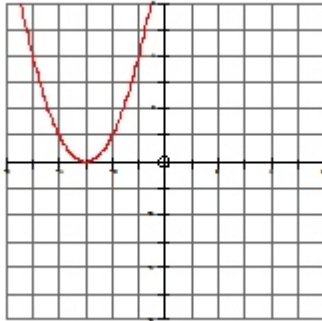
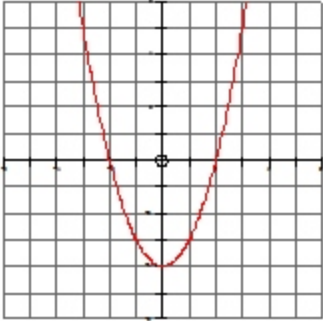
Given the graph of a function write the equation in vertex and standard form.

63)

64)

65)

66)

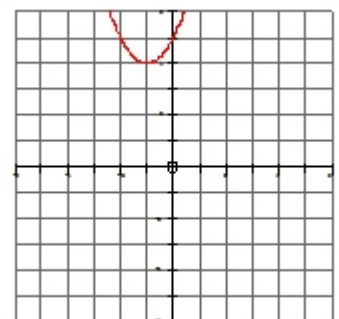
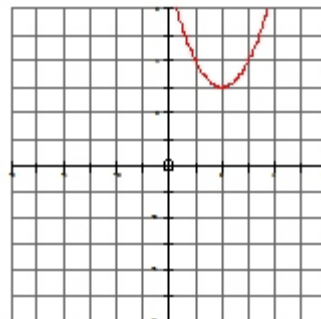
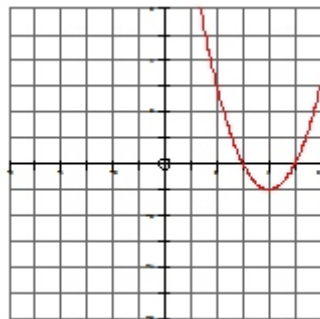
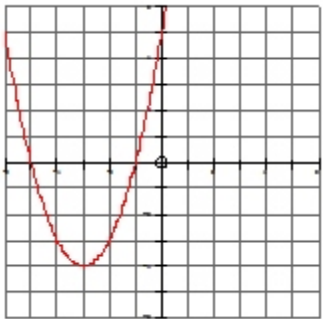


67)

68)

69)

70)



Convert each function to factored form. Give all intercepts and vertex. Graph. Check your work on the calc.

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

72)  $f(x) = (x - 5)^2 - 1$

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

74)  $f(x) = (x - 1)^2 - 9$

Convert each function to vertex form. Give the vertex and y intercept. Graph. Check your work on the calc.

75)  $y = (x + 8)(x + 2)$

76)  $y = x(x - 4)$

77)  $y = (x + 5)(x + 3)$

78)  $y = (x - 5)(x - 1)$

Graph each equation labeling the vertex and all intercepts.

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

80)  $f(x) = x^2 - 6x - 7$

81)  $y = x^2 - 2x - 8$

82)  $y = x^2 + 4x - 5$

Geometry  
Quadratics Review

Factor each quadratic. Next, graph the quadratic.

1.  $x^2 + 14x + 48 = y$

2.  $x^2 + 10x + 16 = y$

3.  $x^2 + 9x + 18 = y$

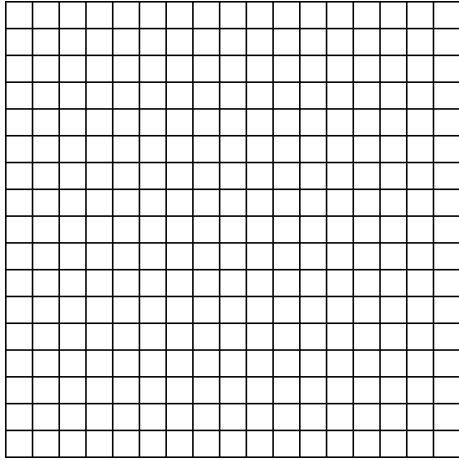
4.  $x^2 - 8x + 7 = y$

5.  $x^2 - 9x + 14 = y$

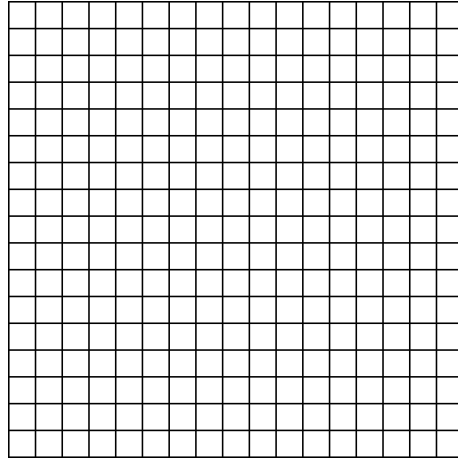
6.  $x^2 - 8x + 15 = y$

Answers:

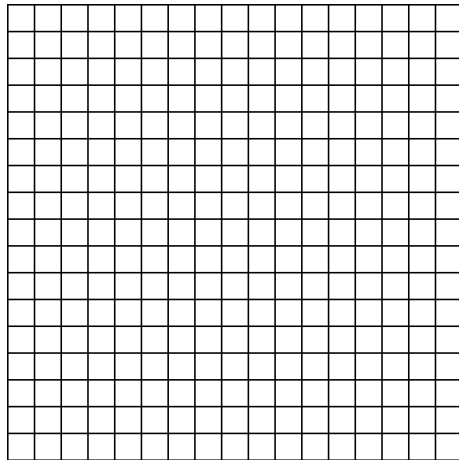
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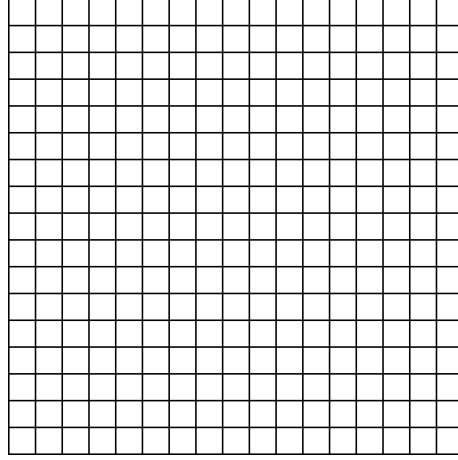
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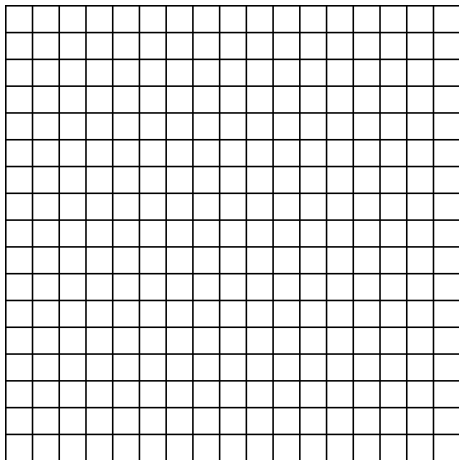
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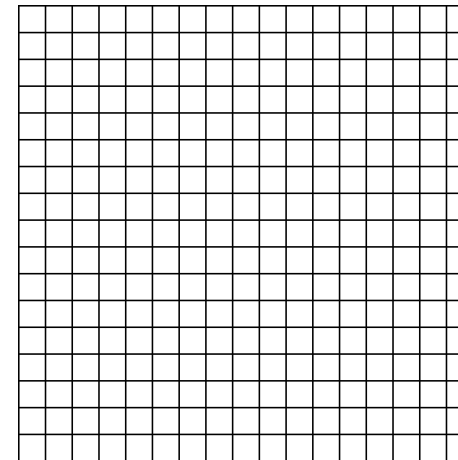
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5.



6.



Complete the square on each quadratic. Next, graph the quadratic.

1.  $x^2 - 6x + 12 = y$

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

3.  $x^2 + 11x - 18 = y$

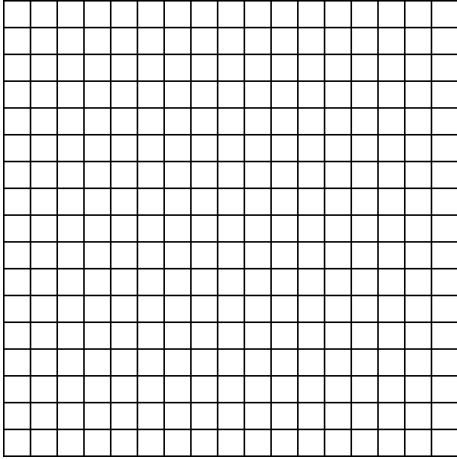
4.  $x^2 + 8x + 20 = y$

5.  $x^2 - 3x + 17 = y$

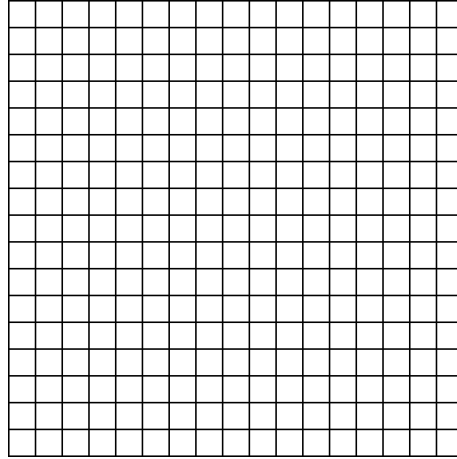
6.  $x^2 + 2x + 10 = y$

Answers:

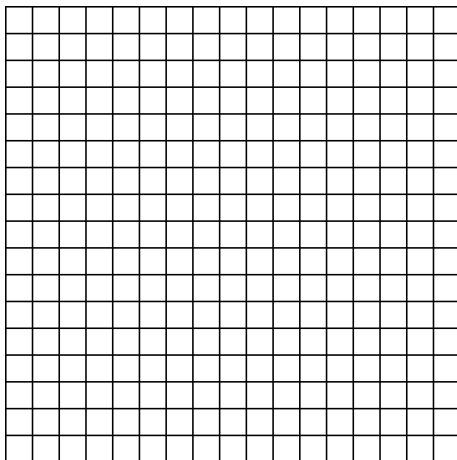
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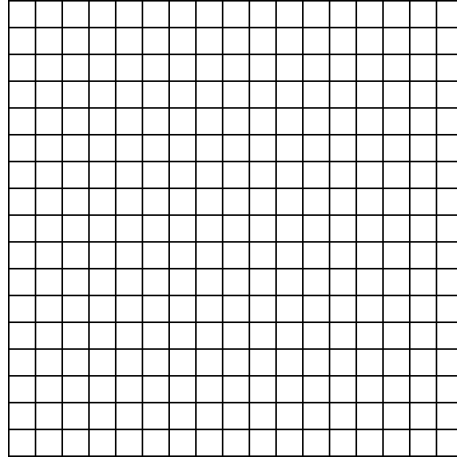
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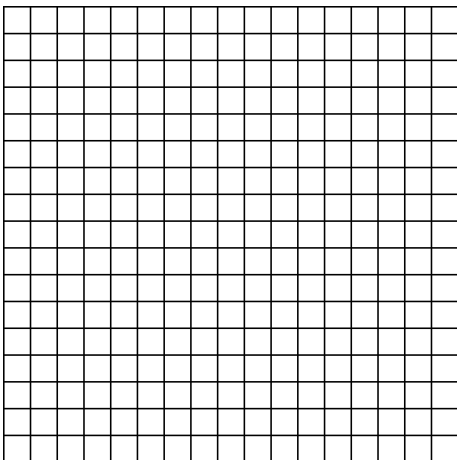
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