

Quadratics Practice Assessment

1. Name each polynomial based on its degree and number of terms.
 $7x^3 - 1$ cubic binomial $2x^2$ quadratic monomial $-x - 2$ linear binomial
 9 constant $7x^8 + 5x^3 - 4x - 3$ 8th degree polynomial

2. Write each polynomial in standard form.
 $5x - 3 + 5 - 6x^2 - 2x + 4x = -6x^2 + 7x + 2$ $3 - 11x - 9x = -20x$
 $2 - 3x^3 - 2x^3 + 3 - 12x + 8x = -5x^3 - 4x + 5$
 $6x^2 - 6x + 2x - x^2 - 2x + x - 3 = 5x^2 - 7x - 3$

Calculate the sum or difference. Write the answer in standard form.

3. $(3x^2 - 3x + 5) - (6x^2 + 6x - 9) = -3x^2 - 9x + 14$
 4. $(2x^4 + 5x^3 + 5) + (3x^4 - 7x^3 - 5x^2 - 6x) = 5x^4 - 2x^3 - 5x^2 - 6x$

Simplify each product. Write your answer in standard form. Show your work.

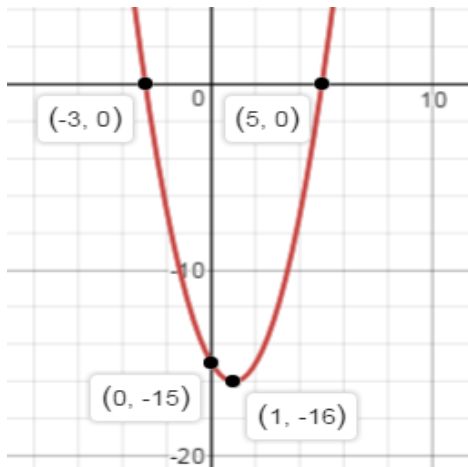
5. $4x(3 - 7x) = -28x^2 + 12x$
 6. $(2x + 7)(2x - 7) = 4x^2 - 49$
 7. $(5x + 2)(5x + 2) = 25x^2 + 20x + 4$
 8. $(4x + 3)(2x - 5) = 8x^2 - 7x - 15$

Fully factor each polynomial.

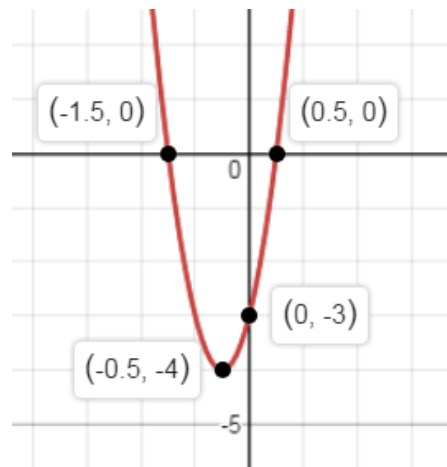
9. $4x^2 - 9 = (2x - 3)(2x + 3)$
 10. $16x^2 + 72x + 81 = (4x + 9)^2$
 11. $x^2 - 2x - 15 = (x - 5)(x + 3)$
 12. $4x^2 + 4x - 3 = (2x + 3)(2x - 1)$

13. Calculate the zeroes of the quadratic functions. Use your work from #11 & #12. Graph the zeroes and list their coordinates.

$y = x^2 - 2x - 15$ $x = 5$ or -3



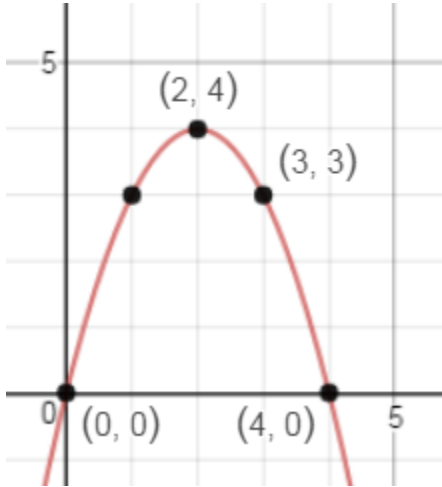
$y = 4x^2 + 4x - 3$ $x = -1.5$ or $.5$



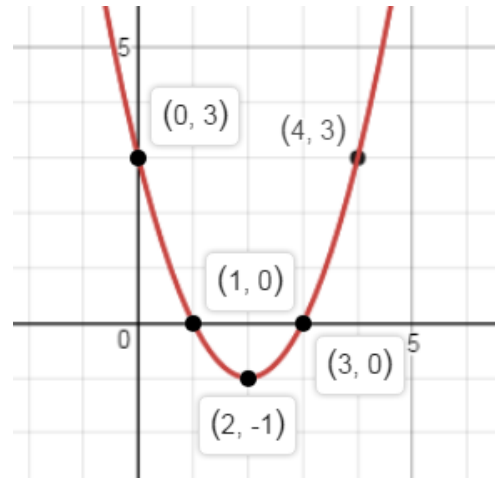
14. A quadratic function has zeroes at $(-2, 0)$ and $(4, 0)$. What is the function's axis of symmetry? $x = 1$
 A quadratic function has zeroes at $(7, 0)$ and $(-3, 0)$. What is the function's axis of symmetry? $x = 2$

Sketch the function. Your sketch must include the vertex and two points on each side of it.

15. $y = -x^2 + 4x$



16. $y = x^2 - 4x + 3$



17. What is the axis of symmetry for #15? $x = 2$
 What is the axis of symmetry for # 16? $x = 2$

18. What is the vertex for #15? $(2, 4)$
 What is the vertex for # 16? $(2, -1)$

Use the function rules for #19 & #20.

$f(x) = x^2 - 3x - 4$; $g(x) = -6x^2$; $h(x) = -x^2 + 2x + 5$; $j(x) = 5x^2 - 2x + 1$

19. Which of the functions $\{f(x), g(x), h(x), \text{ and } j(x)\}$ open up? $f(x), j(x)$
 Which of the functions $\{f(x), g(x), h(x), \text{ and } j(x)\}$ open down? $g(x), h(x)$
 Which of the functions $\{f(x), g(x), h(x), \text{ and } j(x)\}$ have a maximum vertex? $g(x), h(x)$
 Which of the functions $\{f(x), g(x), h(x), \text{ and } j(x)\}$ have a minimum vertex? $f(x), j(x)$
 Which of the functions $\{f(x), g(x), h(x), \text{ and } j(x)\}$ is the narrowest? $g(x)$

20. What are the y-intercepts for each of the functions?

$f(x)$: -4 $g(x)$: 0 $h(x)$: 5 $j(x)$: 1

1. The length of a rectangle exceeds its width by 4 inches. Find the dimensions of the rectangle if its area is 96 square inches.

8 in x 12 in

2. If the measure of one side of a square is increased by 2 centimeters and the measure of the adjacent side is decreased by 2 centimeters, the area of the resulting rectangle is 32 square centimeters. Find the measure of one side of the square.

x=6

3. Joe's rectangular garden is 6 meters long and 4 meters wide. He wishes to double the area of his garden by increasing its length and width by the same amount. Find the number of meters by which each dimension must be increased.

x = 2

4. After t seconds, a ball tossed in the air from the ground level reaches a height of h feet given by the equation $h = 144t - 16t^2$.

- a. What is the height of the ball after 3 seconds? 288 ft
- b. What is the maximum height the ball will reach? 324 sec (at 4.5 sec)
- c. After how many seconds will the ball hit the ground before rebound? 9 sec

5. A rocket carrying fireworks is launched from a platform on a lake. The rocket will fall into lake after exploding at its maximum height. The rocket's height above the surface of the lake is given by

- a. $h = -16t^2 + 320t$.

- a. What is the height of the rocket after 1.5 seconds? 444 ft
- b. What is the maximum height reached by the rocket? 1600 ft at 10 sec

c. After how many seconds after it is launched will the rocket hit the lake?