

Algebra II/Trig: Ch. 5 Sections 1-3 QUIZ

Show that each function is a quadratic function by writing it in the form $f(x) = ax^2 + bx + c$ and identifying a , b , and c .

1. $f(x) = (x+1)(x-7)$

$$f(x) = x^2 - 7x + x - 7$$

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

$$a = 1$$

$$b = -6$$

$$c = -7$$

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

$$(x-2)(x-2) + 9$$

$$x^2 - 2x - 2x + 4 + 9$$

$$f(x) = x^2 - 4x + 13$$

$$a = 1$$

$$b = -4$$

$$c = 13$$

Identify whether each function is a quadratic function.

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

yes


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

$$\begin{aligned} f(x) &= x^2 - (x+1)(x+1) \\ &= x^2 - (x^2 + x + x + 1) \\ &= x^2 - x^2 - 2x - 1 \\ f(x) &= -2x - 1 \end{aligned}$$

No

State whether each parabola opens up or down, and whether the y-coordinate of the vertex is the maximum value or minimum value of the function.

5. $f(x) = 16 - x^2$

down 

6. $f(x) = (4-x)(6-x)$

$$24 - 4x - 6x + x^2$$

up 

Solve each equation. Give exact solutions.

7. $\frac{16x^2}{16} = \frac{49}{16}$

$$\sqrt{x^2} = \sqrt{\frac{49}{16}}$$

$$x = \pm \frac{7}{4}$$

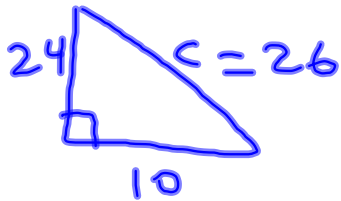
8. $\sqrt{(x-4)^2} = \sqrt{19}$

$$x-4 = \pm \sqrt{19}$$

$$x = \pm \sqrt{19} + 4$$

Find the missing side length in right triangle ABC. Give exact solutions.

9. $a = 24$ and $b = 10$



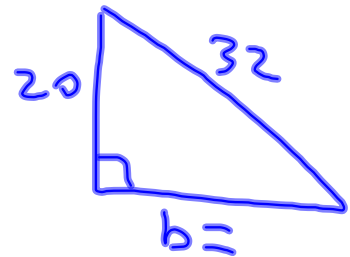
$$24^2 + 10^2 = c^2$$

$$576 + 100 = c^2$$

$$\sqrt{676} = \sqrt{c^2}$$

$$c = 26$$

10. $a = 20$ and $c = 32$



$$32^2 - 20^2 = b^2$$

$$1024 - 400 = b^2$$

$$\sqrt{624} = \sqrt{b^2}$$

$$\sqrt{624} = b$$

Factor each expression.

11. $3x(x-8)+7(x-8)$

$$(x-8)(3x+7)$$

12. $x^2+14x+49$

$$(x+7)(x+7)$$

or

$$(x+7)^2$$

Solve each equation by factoring and applying the Zero-Product Property.

13. $x^2 - 144 = 0$

$$(x+12)(x-12) = 0$$

$$x = -12, 12$$

14. $x^2 + 3x - 4 = 0$

$$(x+4)(x-1) = 0$$

$$x = -4, 1$$

15. $2x^2 + 17x - 9 = 0$

$$(2x-1)(x+9) = 0$$

$$x = \frac{1}{2}, -9$$

16. $9x^2 - 6x = -1$

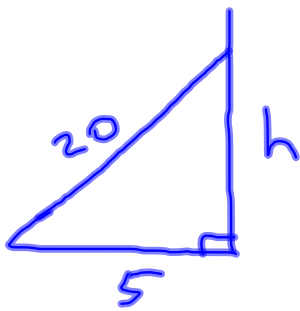
$$\begin{array}{r} + 1 + 1 \\ \hline 9x^2 - 6x + 1 = 0 \end{array}$$

$$(3x-1)(3x-1) = 0$$

$$x = \frac{1}{3}$$

Solve

17. Karli put a ladder against a house. The bottom of the 20 ft. ladder is 5 ft. from the base of a house. At what height does the ladder touch the house?



$$h = \sqrt{375}$$
$$\approx 19.36 \text{ ft.}$$

$$20^2 - 5^2 = h^2$$

$$400 - 25 = h^2$$

$$\sqrt{375} = h$$