

Quadratics Quiz
(36 pts)

Name Answers

1) What makes an expression quadratic? Explain in words AND give one example of a quadratic expression and one example that is NOT a quadratic expression. (3 pts)

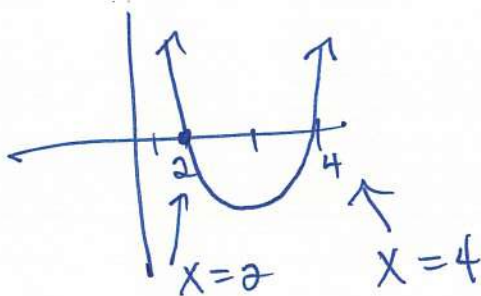
An expression with a squared term
where the squared term is the biggest exponent
is quadratic ex: $x^2 + 5$ ex not $2x + 5$

Solve the quadratic equation below using three methods: graphing, factoring, and the quadratic formula.
(9 pts)

2) $x^2 - 6x + 8 = 0$

Graphing (Show $y_1 =$ and make sketch)

$$y_1 = x^2 - 6x + 8$$
$$y_2 = 0$$



Factoring

$$x^2 - 6x + 8 = 0$$

$$(x-4)(x-2) = 0$$

$$x-4=0 \quad x-2=0$$

$$\boxed{x=4} \quad \boxed{x=2}$$

Quadratic Formula

$$x^2 - 6x + 8 = 0$$

$$a=1, b=-6, c=8$$

$$x = \frac{6 \pm \sqrt{36 - 4(1)(8)}}{2(1)}$$

$$= \frac{6 \pm \sqrt{4}}{2}$$

$$= \frac{6 \pm 2}{2}$$

$$x = \frac{6+2}{2} = \boxed{4}$$

$$x = \frac{6-2}{2} = \boxed{2}$$

Solve by factoring. (Note: If you solve these using another method, you will receive half credit.)
(4 pts each)

3) $4x^2 - 9 = 0$

$$(2x-3)(2x+3) = 0$$

$$2x-3=0$$

$$2x=3$$

$$x = \frac{3}{2}$$

$$2x+3=0$$

$$2x=-3$$

$$x = -\frac{3}{2}$$

4) $2x^2 + 7x + 3 = 0$

$$(2x+1)(x+3) = 0$$

$$2x+1=0$$

$$2x=-1$$

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

$$x+3=0$$

$$x = -3$$

Solve using the quadratic formula. Leave answers in simplest form. (4 pts each)

5) $4x^2 - x - 3 = 0$

$$a=4, b=-1, c=-3$$

$$x = \frac{1 \pm \sqrt{1 - 4(4)(-3)}}{2(4)}$$

$$= \frac{1 \pm \sqrt{49}}{8}$$

$$= \frac{1 \pm 7}{8}$$

$$x = \frac{1+7}{8} = 1$$

$$x = \frac{1-7}{8} = -\frac{6}{8} = -\frac{3}{4}$$

Solve using the quadratic formula. Leave answers in simplest form.

6) $x^2 = -2x + 4$

$$x^2 + 2x - 4 = 0 \quad a = 1, b = 2, c = -4$$

$$x = \frac{-2 \pm \sqrt{4 - 4(1)(-4)}}{2(1)}$$

$$= \frac{-2 \pm \sqrt{20}}{2}$$

$$= \frac{-2 \pm \sqrt{4} \sqrt{5}}{2}$$

$$= \frac{-2 \pm 2\sqrt{5}}{2}$$

$$x = -1 \pm \sqrt{5}$$

7) A student used the quadratic formula to solve a quadratic equation. What two errors is the student making? (2 pts)

$$7x^2 + 9x = 2 \quad \rightarrow \quad 7x^2 + 9x - 2 = 0$$

step 1: $x = \frac{-9 \pm \sqrt{(9)^2 - 4(7)(-2)}}{2(7)}$

$$\begin{aligned} a &= 7 \\ b &= 9 \\ c &= -2 \end{aligned}$$

step 2: $x = \frac{9 \pm \sqrt{25}}{14}$ etc.

What TWO errors were made in the steps shown above?

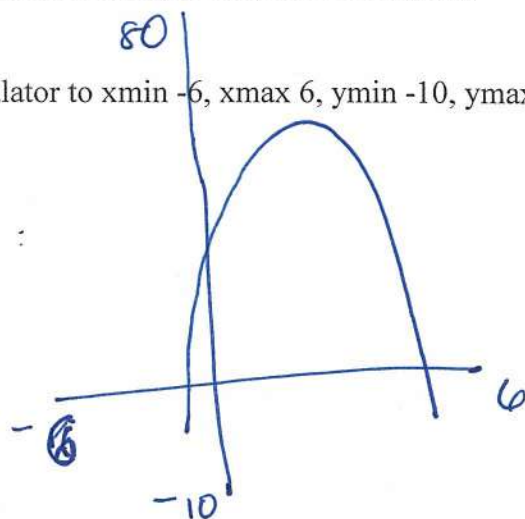
Error #1: $x = \frac{-b \pm \sqrt{\quad}}{2a}$ the 9 should be -9

Error #2: the c is -2, not 2

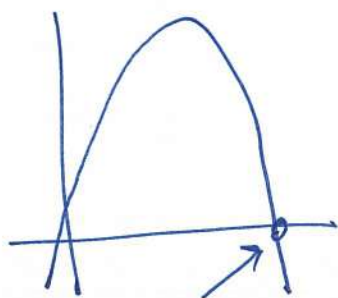
8) A ball is thrown straight upward where its height h feet above the ground after t seconds is given by $h = -16t^2 + 64t + 5$. Answer the questions below. Show and/or describe all your work. (6 pts)

a) Make a sketch of the parabola. Adjust your graphing calculator to xmin -6, xmax 6, ymin -10, ymax 80.

$$y_1 = -16x^2 + 64x + 5$$



b) When does the ball hit the ground? Round answers to the nearest tenth of a second.



$$y_1 = -16x^2 + 64x + 5$$

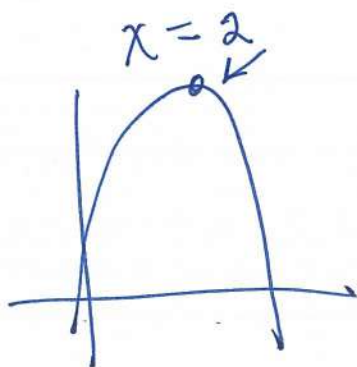
$$y_2 = 0$$

4.1 sec

[2nd] [Trace] 5: Intersect

$$x = 4.0766$$

c) At what time does the ball reach its maximum height? What is its maximum height?



[2nd] [Trace]

4: Maximum

at 2 sec ht = 69 ft

table

x	y
0	5
1	53
2	69
3	53