

Unit 6 Practice Exam

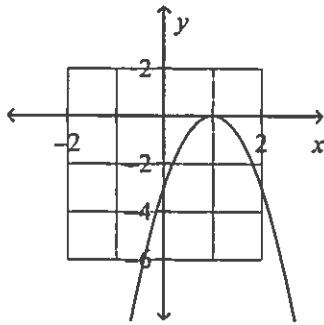
Multiple Choice

Identify the choice that best completes the statement or answers the question.

- A 1. Which of the quadratic functions has the widest graph?
 a. $y = -\frac{1}{2}x^2$ b. $y = -5x^2$ c. $y = -3x^2$ d. $y = -\frac{7}{8}x^2$

- A 2. A parabola _____ has an axis of symmetry.
 a. always b. sometimes c. never

- C 3. For which discriminant is the graph possible?



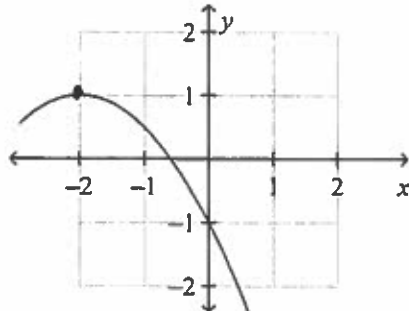
- a. $b^2 - 4ac = 6$ b. $b^2 - 4ac = -9$ c. $b^2 - 4ac = 0$

- C 4. Use the discriminant to find the number of solutions for the equation. $x^2 - 16x + 60 = 0$
 (YOU DO NOT HAVE TO SOLVE.)
 a. 0 b. 1 c. 2

$b^2 - 4ac$
 $(-16)^2 - 4(1)(60)$
 $256 - 240$
 $(+16)$

Short Answer

5. Identify the vertex of the graph. Tell whether it is a minimum or maximum.



$V(-2, 1)$
 maximum

Name: _____

A

6. Order the group of quadratic functions from widest to narrowest graph.

$y = -2x^2, y = \frac{2}{3}x^2, y = -\frac{1}{4}x^2$

N M W

$y = -\frac{1}{4}x^2 < y = \frac{2}{3}x^2 < y = -2x^2$
W M N

Use any method to solve the equation. If necessary, round to the nearest hundredth.

7. $6x^2 - 31 = 0$
 $+31 +31$

$6x^2 = 31$

$\sqrt{x^2} = \sqrt{5.16}$ or $a=6$
 $b=0$
 $c=-31$
 $x = \pm 2.27$

$-0 \pm \sqrt{0^2 - 4(6)(-31)} = \frac{\pm \sqrt{744}}{2(6)} = \frac{\pm 27.28}{12} = \pm 2.27$

8. Find the equation of the axis of symmetry and the coordinates of the vertex of the graph of the function.

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

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

$2(-1)^2 + 4(-1) - 3$
 $2 - 4 - 3$
 -5

AXIS OF SYMMETRY: $x = -1$ VERTEX: $(-1, -5)$

9. Solve the equation using square roots. $x^2 - 14 = -10$
 $+14 +14$

$\sqrt{x^2} = \sqrt{4}$

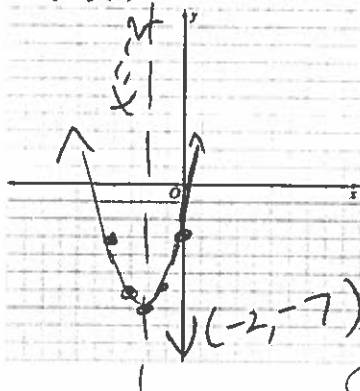
$x = \pm 2$

10. Solve the equation using square roots. $\frac{x^2}{3} = \frac{54}{3}$

$\sqrt{x^2} = \sqrt{18}$

$x = \pm 4.24$

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



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

x	$(x)^2 + 4(x) - 3$	y
-4	16 - 16 - 3	-3
-3	9 - 12 - 3	-6
-2	4 - 8 - 3	-7
-1	1 - 4 - 3	-6
0	0 + 0 - 3	-3

Vertex

12. Solve the equation by quadratic formula or factoring. $z^2 + 2z - 8 = 0$

$a = 1$
 $b = 2$
 $c = -8$

$$x = \frac{-2 \pm \sqrt{(2)^2 - 4(1)(-8)}}{2(1)} = \frac{-2 \pm \sqrt{4 + 32}}{2}$$

$$= \frac{-2 \pm \sqrt{36}}{2} = \frac{-2 \pm 6}{2} \left\{ \begin{array}{l} \frac{4}{2} = 2 \\ \frac{-8}{2} = -4 \end{array} \right.$$

$$(z+4)(z-2) = 0$$

$$z+4=0 \quad z-2=0$$

$$z = -4 \quad z = 2$$

13. Solve the equation by quadratic formula or factoring. $2x^2 + 7x - 15 = 0$

$a = 2$
 $b = 7$
 $c = -15$

$$x = \frac{-7 \pm \sqrt{(7)^2 - 4(2)(-15)}}{2(2)} = \frac{-7 \pm \sqrt{49 + 120}}{4} = \frac{-7 \pm \sqrt{169}}{4} = \frac{-7 \pm 13}{4}$$

$$\frac{6}{4} = \frac{3}{2} = 1.5$$

$$\frac{-20}{4} = -5$$

14. Use the Quadratic Formula to solve the equation. $9x^2 + 4x - 16 = 0$

$a = 9$
 $b = 4$
 $c = -16$

$$x = \frac{-4 \pm \sqrt{(4)^2 - 4(9)(-16)}}{2(9)} = \frac{-4 \pm \sqrt{16 + 576}}{18} = \frac{-4 \pm \sqrt{592}}{18} = \frac{-4 \pm 24.33}{18}$$

$$\frac{20.33}{18} = 1.13$$

$$\frac{-28.3}{18} = -1.57$$

15. Use quadratic formula or factoring to solve the equation. $x^2 - 3x - 4 = 0$

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

$$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(1)(-4)}}{2(1)} = \frac{3 \pm \sqrt{9 + 16}}{2}$$

$$= \frac{3 \pm \sqrt{25}}{2} = \frac{3 \pm 5}{2} \left\{ \begin{array}{l} \frac{8}{2} = 4 \\ \frac{-2}{2} = -1 \end{array} \right.$$

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

$$x-4=0 \quad x+1=0$$

$$x = 4 \quad x = -1$$

16. Use quadratic formula or factoring to solve the equation. $3x^2 - 6x - 24 = 0$

$a = 3$
 $b = -6$
 $c = -24$

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(3)(-24)}}{2(3)} = \frac{6 \pm \sqrt{36 + 288}}{6} = \frac{6 \pm \sqrt{324}}{6}$$

$$= \frac{6 \pm 18}{6} \left\{ \begin{array}{l} \frac{24}{6} = 4 \\ \frac{-12}{6} = -2 \end{array} \right.$$

$$3x^2 - 6x - 24 = 0$$

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

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

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

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

$$\frac{592}{18} = 32.88$$

$$\frac{296}{18} = 16.44$$

$$\frac{148}{18} = 8.22$$

$$\frac{74}{18} = 4.11$$

$$\frac{37}{18} = 2.05$$

$$\frac{2.05 \sqrt{37}}{18} = 0.11$$

$$\frac{-2 \pm 2\sqrt{37}}{6} = \frac{-4 \pm 4\sqrt{37}}{6}$$

Name: _____

$a = -3$
 $b = -5$
 $c = 8$

$-3y^2 - 5y + 8 = 0$

A

17. Use quadratic formula or factoring to solve the equation. $-3y^2 - 5y = -8$

$$y = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(-3)(8)}}{2(-3)} = \frac{5 \pm \sqrt{25 + 96}}{-6} = \frac{5 \pm \sqrt{121}}{-6} = \frac{5 \pm 11}{-6}$$

$\frac{5+11}{-6} = \frac{16}{-6}$ $\frac{5-11}{-6} = \frac{-6}{-6}$

-2.67

$+1$

Solve the equation by quadratic formula or factoring.

18. $-12 = -3x^2 + 9x$ $-3x^2 + 9x + 12 = 0$

$$x = \frac{-9 \pm \sqrt{81 + 144}}{2(-3)} = \frac{-9 \pm \sqrt{225}}{-6} = \frac{-9 \pm 15}{-6}$$

$a = -3$
 $b = 9$
 $c = 12$

$\frac{-9+15}{-6} = \frac{6}{-6} = -1$

$\frac{-9-15}{-6} = \frac{-24}{-6} = 4$

Simplify the radical expression.

19. $\sqrt{144} = 12$

20. $\sqrt{160} = \sqrt{(2 \cdot 2 \cdot 2 \cdot 2) \cdot 2 \cdot 5}$
 $4 \cdot 2 \sqrt{2 \cdot 5} = 4\sqrt{10}$

21. Simplify the radical expression. $\sqrt{128} = \sqrt{(2 \cdot 2 \cdot 2 \cdot 2 \cdot 2) \cdot 2}$

$2 \cdot 2 \cdot 2 \sqrt{2} = 8\sqrt{2}$

Solve the equation by quadratic formula. Put your answer in simplest radical form.

22. $x^2 + 6x - 10 = 0$

$$x = \frac{-6 \pm \sqrt{36 + 40}}{2} = \frac{-6 \pm \sqrt{76}}{2}$$

$= \frac{-3 \pm \sqrt{19}}{1}$ $\frac{-3 \pm \sqrt{19}}{1}$ or $-3 \pm \sqrt{19}$

$a = 1$
 $b = 6$
 $c = -10$

$\sqrt{76} = 2\sqrt{19}$
 $\frac{-6 \pm 2\sqrt{19}}{2} = -3 \pm \sqrt{19}$