Name: KEY Class: _____ Date: _____ A

Unit 6 Practice Exam 2018

Multiple Choice

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

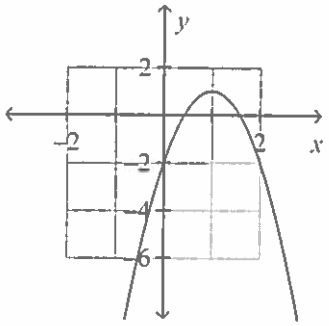
A 1. Which of the quadratic functions has the widest graph?

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

B 3. For which discriminant is the graph possible?



a. $b^2 - 4ac = 0$ b. $b^2 - 4ac = 10$ c. $b^2 - 4ac = -8$

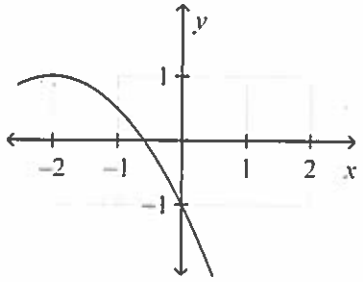
C 4. Use the discriminant to find the number of solutions for the equation. $x^2 - 16x + 60 = 0$
(YOU DO NOT HAVE TO SOLVE.)

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

a. 0 b. 1 c. 2

Short Answer

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



V = (-2, 1)

maximum

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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. $6x^2 - 31 = 0$

$+31 \quad +31$

$6x^2 = 31$

$\sqrt{x^2} = \sqrt{5.16}$ OR $a=6$, $b=0$, $c=-31$

$x = \pm 2.27$

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

$+2.27 \quad -2.27$

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

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

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

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

$2 - 4 - 3$

-5

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

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

$+14 \quad +14$

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

$x = \pm 2$

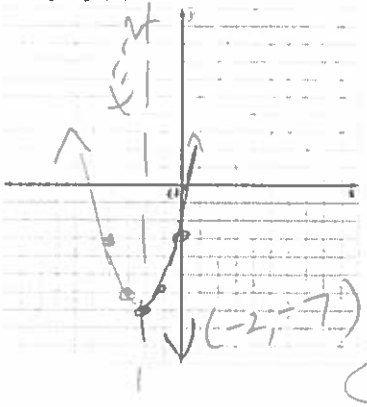
10. Solve the equation using square roots. $3x^2 = 54$

$\frac{3x^2}{3} = \frac{54}{3}$

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

$x = \pm 4.24$

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 Vertex
-1	$1 - 4 - 3$	-6
0	$0 + 0 - 3$	-3

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

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

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

$= \frac{-2 \pm \sqrt{36}}{2} = \frac{-2 \pm 6}{2}$ $\begin{cases} \frac{4}{2} = 2 \\ \frac{-8}{2} = -4 \end{cases}$

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

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

$z=-4$ $z=2$

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

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

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

$\frac{6}{4} = \frac{3}{2}$ $\frac{-20}{4}$

1.5, -5

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

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

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

$\frac{20.33}{18}$ $\frac{-28.3}{18}$

1.13, -1.57

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

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

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

$= \frac{3 \pm \sqrt{25}}{2} = \frac{3 \pm 5}{2}$ $\begin{cases} \frac{8}{2} = 4 \\ \frac{-2}{2} = -1 \end{cases}$

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

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

$x=4$ $x=-1$

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

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

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

$= \frac{6 \pm \sqrt{36+288}}{6} = \frac{6 \pm \sqrt{324}}{6}$

$= \frac{6 \pm 18}{6}$ $\begin{cases} \frac{24}{6} = 4 \\ \frac{-12}{6} = -2 \end{cases}$

$\frac{3}{3}$ $\frac{-8}{3}$

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

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

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

$x=4$ $x=-2$

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

$+3 \quad +3$

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

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

$y = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(-3)(8)}}{2(-3)}$

$= \frac{5 \pm \sqrt{25+96}}{-6} = \frac{5 \pm \sqrt{121}}{-6} = \frac{5 \pm 11}{-6}$

$\frac{16}{-6} = -2.67$

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

Solve the equation by quadratic formula or factoring.

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

$+12 \quad +12$

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

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

$x = \frac{-9 \pm \sqrt{(9)^2 - 4(-3)(12)}}{2(-3)} = \frac{-9 \pm \sqrt{81+144}}{-6}$

$= \frac{-9 \pm \sqrt{225}}{-6} = \frac{-9 \pm 15}{-6}$

$\frac{6}{-6} = -1$

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

Solve the equation by quadratic formula. Round to the nearest hundredth if necessary.

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

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

$x = \frac{-6 \pm \sqrt{(6)^2 - 4(1)(-10)}}{2(1)} = \frac{-6 \pm \sqrt{36+40}}{2} = \frac{-6 \pm \sqrt{76}}{2}$

$= \frac{-6 \pm 8.72}{2}$

$\frac{2.72}{2} = 1.36$

$\frac{-14.72}{2} = -7.36$

Simplify the radical expression.

20. $\sqrt{144}$ $= 12$

21. $\sqrt{160}$

16, 10

4, 4, 2, 5

2, 2, 2, 2

$= \sqrt{(2 \cdot 2)(2 \cdot 2) 2.5}$

$2 \cdot 2\sqrt{10} = 4\sqrt{10}$

22. Simplify the radical expression. $\sqrt{128}$

$\sqrt{(2 \cdot 2)(2 \cdot 2)(2 \cdot 2 \cdot 2)}$

64, 2, 8, 8, 4, 2, 4, 4, 2, 2, 2, 2, 2

$2 \cdot 2 \cdot 2 \cdot \sqrt{2}$

$8\sqrt{2}$