Unit 10 Test Review Name Key Per ____

Match each form of quadratic equation to what it best shows.

1. Vertex Form $y=a(x-h)^2+k$ (c)	a. y-intercept
2. Factored Form $y=a(x-b)(x-c)$ (b)	b. x-intercepts
3. Standard Form $y=ax^2+bx+c$ (a)	c. vertex and axis of symmetry

4. *Write the quadratic formula.*

$$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$

What is the value of the discriminant, and how many real solutions does it have?

5. $6x^2-3x-3=0$ $(-3)^2-4(6)(-3)$ $9+72=81$ 2 real solutions	6. $3x^2-4x=-7$ $3x^2-4x+7=0$ $(-4)^2-4(3)(7)$ $16-84$ -68 no real solutions

Convert each equation below into vertex form. Also, identify the vertex.

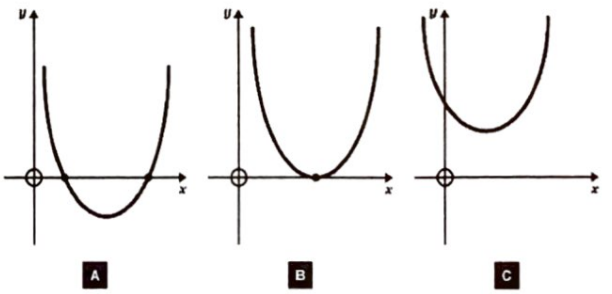
7. $y=x^2+16x+70$ $y=(x^2+16x+64)+70-64$ $y=(x+8)^2+6$ $V=(-8,6)$	8. $y=-7x^2+14x+10$ $y=-7(x^2-2x+1)+10+7$ $y=-7(x-1)^2+17$ $V=(1,17)$

Match each type of discriminant with its appropriate graph.

9. Positive discriminant A

10. Negative discriminant C

11. Discriminant is zero B



Solve the following quadratic equations using any method.

12. $4a^2+3a-14=0$

$$x=\frac{-3\pm\sqrt{(3)^2-4(4)(-14)}}{2(4)}$$

$$x=\frac{-3\pm\sqrt{9+224}}{8}=\frac{-3\pm\sqrt{233}}{8}$$

13. $10x^2-10x+9=0$

$$x=\frac{-(-10)\pm\sqrt{(-10)^2-4(10)(9)}}{2(10)}$$

$$x=\frac{10\pm\sqrt{100-360}}{20}$$

$$x=\frac{10\pm\sqrt{-260}}{20}$$ No real solutions

14. $v^2+8v-28=-8$

$v^2+8v-20=0$

$(v+10)(v-2)=0$

$v=-10$ or $v=2$

15. $8v^2+4v=5$

$8v^2+4v-5=0$

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

$$x=\frac{-4\pm\sqrt{16+160}}{16}$$

$\sqrt{16}\cdot\sqrt{11}$

$$x=\frac{-4\pm\sqrt{176}}{16}=\frac{-4\pm4\sqrt{11}}{16}=\frac{-1\pm\sqrt{11}}{4}$$

16. $-3x^2+16x+4=-9x^2+6+12x$

$+9x^2-12x-6 \quad +9x^2-6-12x$

$6x^2+4x-2=0$

$-3 \quad 3 \quad -1$

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

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

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

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

$3x-1=0 \quad x+1=0$

$x=1/3 \quad x=-1$

17. $p^2-12p+21=11$

$-11 \quad -11$

$p^2-12p+10=0$ Not factorable

$$x=\frac{-(-12)\pm\sqrt{(-12)^2-4(1)(10)}}{2(1)}$$

$$x=\frac{12\pm\sqrt{144-40}}{2}$$

$\sqrt{4}\sqrt{26}$

$$x=\frac{12\pm\sqrt{104}}{2}=\frac{12\pm2\sqrt{26}}{2}=6\pm\sqrt{26}$$

18. $2x^2+10x-7=0$

$$x=\frac{-10\pm\sqrt{10^2-4(2)(-7)}}{2(2)}$$

$$x=\frac{-10\pm\sqrt{100+56}}{4}$$

$\sqrt{4}\sqrt{39}$

$$x=\frac{-10\pm\sqrt{156}}{4}=\frac{-10\pm2\sqrt{39}}{4}=\frac{-5\pm\sqrt{39}}{2}$$

19. $m^2-15m=-5m+19$

$m^2-10m-19=0$

$m^2-10m+25=19+25$

$\sqrt{(m-5)^2}=\pm\sqrt{44}$ $\sqrt{4}\cdot\sqrt{11}$

$m-5=\pm2\sqrt{11}$

$m=5\pm2\sqrt{11}$

Complete the perfect square trinomial.

20. x^2+12x+ 36	21. x^2-30x+ 225	22. x^2+14x+ 49
Factored form: $(x+6)^2$	Factored form: $(x-15)^2$	Factored form: $(x+7)^2$

Match each graph with the appropriate equation and EXPLAIN how you know.

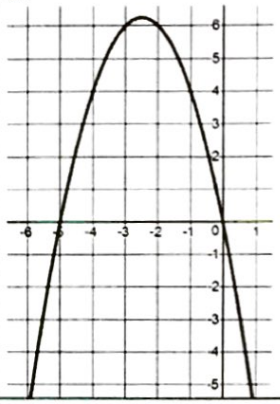
23. $y=-(x+5)^2$

→ concave down

→ V: (-5, 0)

(b)

a.



24. $y=x^2+10x+25$

$0=(x+5)^2$

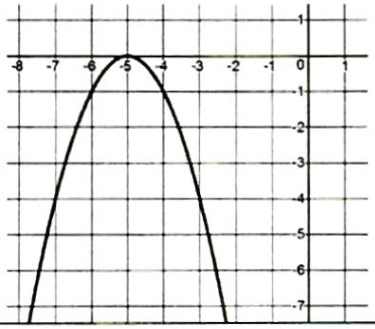
→ $x=-5$ one real solution

→ y-intercept: (0, 25)

→ concave up

(d)

b.



25. $y=x^2-25$

$0=(x+5)(x-5)$

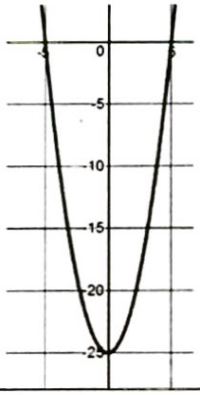
→ $x=-5$ or $x=5$

→ y-intercept: (0, -25)

→ concave up

(c)

c.



26. $y=-x(x+5)$

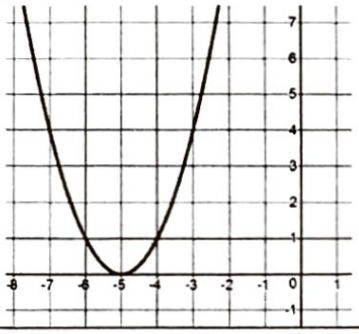
$0=-x(x+5)$

→ $x=0$ or $x=-5$

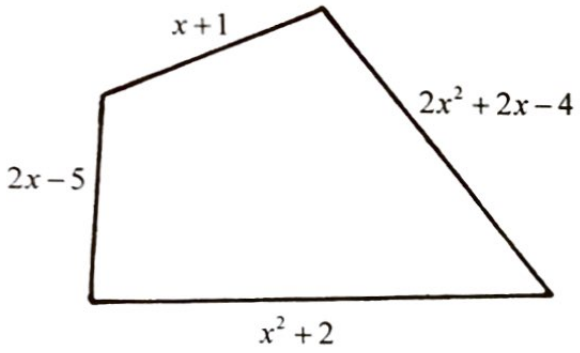
→ concave down

(a)

d.



27. *The perimeter of the quadrilateral shown is 94 meters. What is the value of x? What is the base?*



$2x-5 + x+1 + 2x^2+2x-4 + x^2+2 = 94$

$3x^2+5x-6 = 94$

$3x^2+5x-100 = 0$

$x = \frac{-5 \pm \sqrt{5^2-4(3)(-100)}}{2(3)}$

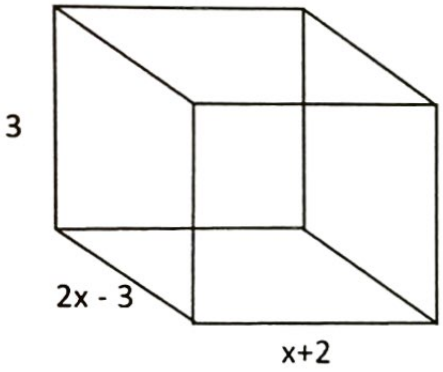
$x = \frac{-5 \pm \sqrt{25+1200}}{6} = \frac{-5 \pm \sqrt{1225}}{6}$

$= \frac{-5 \pm 35}{6}$

$= \frac{-40}{6}$ or $\frac{30}{6} = 5$

Base $5^2+2 = 27$

28. *Write an equation to represent the volume (V) of the box shown below in 3 unique ways.*



$V = 3(2x-3)(x+2)$ ①

$V = 3(2x^2+x-6)$ ②

$V = (6x-9)(x+2)$ ③

$V = 6x^2+3x-18$ ④

29. *Jeanine used the quadratic formula to solve the quadratic equation:* $2x^2+6x-4=0$. *Decide whether she is right or wrong. If she is correct, write "correct". If she is incorrect, circle the error and redo the problem.*

$a=2, b=6, c=-4$

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

$x = \frac{-6 \pm \sqrt{36-32}}{4}$ → $+32$ → $\frac{-6 \pm \sqrt{36+32}}{4}$

$x = \frac{-6 \pm \sqrt{4}}{4}$ → $\frac{-6 \pm \sqrt{68}}{4}$

$x = \frac{-6 \pm 2}{4}$ → $\frac{-6 \pm 2\sqrt{17}}{4}$

$x = \frac{-4}{4}, \frac{-8}{4}$ → $\frac{-3 \pm \sqrt{17}}{2}$

$x = -1, -2$

Identify the form of each quadratic, then find the x-intercepts.

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

Factored form

$x+5=0$ or $2x-3=0$

$x=-5$ $\quad x=\frac{3}{2}$

$(-5,0)$ $\quad (\frac{3}{2},0)$

31. $f(x) = -\frac{3}{2}(x+7)^2+12$

long way

$0 = -\frac{3}{2}(x^2+14x+49)+12$

$2\times\left(0 = -\frac{3}{2}x^2-21x-\frac{147}{2}+12\right)\times 2$

$0 = -3x^2-42x-147+24$

$0 = -3x^2-42x-123$

$x = \frac{-(-42)\pm\sqrt{(-42)^2-4(-3)(-123)}}{2(-3)}$ ($\sqrt{144}\sqrt{2}$)

$x = \frac{42\pm\sqrt{1764-1476}}{-6} = \frac{42\pm\sqrt{288}}{-6}$

$= \frac{42\pm 12\sqrt{2}}{-6} = -7\pm 2\sqrt{2}$

same answers

#31 short way

$0 = -\frac{3}{2}(x+7)^2+12$

$-12 = -\frac{3}{2}(x+7)^2$

$\pm\sqrt{8} = \sqrt{(x+7)^2} \rightarrow \pm 2\sqrt{2} = x+7$

$-7\pm 2\sqrt{2} = x$

Answer Key

1. c	2. b	3. a
4. $x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$	5. 81, two real solutions	6. -68, zero real solutions
7. $x=(x+8)^2+6$ (-8,6)	8. $y=-7(x-1)^2+17$ (1,17)	9. A
10. C	11. B	12. $a=\frac{-3\pm\sqrt{233}}{8}$
13. No Solution	14. $v=2,-10$	15. $v=\frac{-1\pm\sqrt{11}}{4}$
16. $x=\frac{1}{3},-1$	17. $p=6\pm\sqrt{26}$	18. $x=\frac{-5\pm\sqrt{39}}{2}$
19. $m=5\pm 2\sqrt{11}$	20. 36	21. 225
22. 49	23. b, since the parabola is concave down and the only x-intercept is -5	24. d, since the parabola is concave up and the only x-intercept is -5
25. c, since the parabola is concave up and the y-intercept is -25	26. a, since the parabola is concave down and the x-intercepts are 0 and -5	27. x = 5 Base = 27 meters
28. There are many correct answers, some of them are: $V=3(2x-3)(x+2)$, $V=(6x-9)(x+2)$, $V=6x^2+3x-18$, $V=(2x-3)(3x+6)$, $V=(2x-3)(x+2)3$, $V=3(2x^2+x-6)$		
29. She is incorrect (the error is that the -32 in the second step should be a positive 32). $x=\frac{-3\pm\sqrt{17}}{2}$	30. factored form x-ints = $(-5,0)\left(\frac{3}{2},0\right)$	31. vertex form x-ints = $(-7+2\sqrt{2},0)$ $(-7-2\sqrt{2},0)$

Vertex form $y = a(x-h)^2 + k$

- vertex
- axis of symmetry
- concave up/down

Factored form $y = a(x-b)(x-c)$

- x-intercepts
- concave up/down
- # of solutions

Standard form $y = ax^2 + bx + c$

- y-intercept
- concave up/down
- axis of symmetry $x = \frac{-b}{2a}$