Name: _____

Quadratics Test Review Packet

Factor each expression completely. Remember: GCF, DOTS, then Tic-Tac-Toe!!

1. $2x^2 - 4x - 6$

2. $7x^2 - 28x$

3. $25x^2 - 50$

4. $9x^2 - 4$

Solve each equation: **(Quadratic Formula OR Zero Product Property OR find the zeros in calculator)**

5. $2x^2 + 3x - 8 = 0$
(approx. decimal answers please)

6. $(2x - 5)(x - 6) = 0$

7. $(3x-5)(x-2)=0$

8. $3x^2+13x+10=0$

Find the discriminant of each quadratic to determine how many solutions it has.

Discriminant: b^2-4ac (the part under the square root)

9. $3x^2-6x+5=0$

discriminant:

# of solutions:

could it be factored? Yes or No

10. $x^2-10=0$

discriminant:

# of solutions:

could it be factored? Yes or No

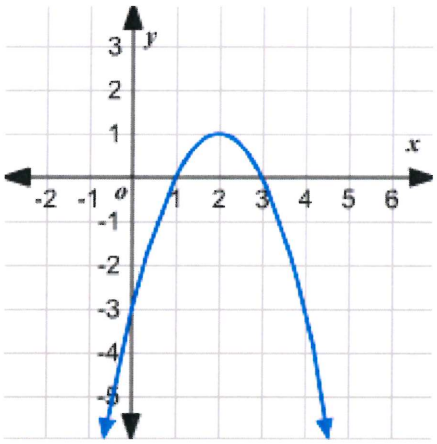
11. $2x^2-4x+2=0$

discriminant:

# of solutions:

could it be factored? Yes or No

12. A function of x is graphed below.



a. Which of these describes the graph?

a. $y = (x + 2)^2 - 1$

b. $y = -(x - 2)^2 - 1$

c. $y = -(x - 2)^2 + 1$

d. $y = (x - 2)^2 + 1$

b. What are the **x-intercepts (zeros)** of the function?

c. What is the **y-intercept** of the function?

d. What is the maximum **y-value** of the function?

13. A ball is thrown from the top of a tall building. The height, in feet, between the ball and the ground t seconds after it is thrown is given by $h = -16t^2 - 9t + 400$.

a) How high will the ball be after 4.5 seconds?

a. 400 feet b. 4.5 feet c. 35.5 feet d. 4.73 feet

b) When will the ball hit the ground?

a. 400 feet b. 4.5 feet c. 35.5 feet d. 4.73 feet

14. A mechanic sells rotors for cars for $150, and he usually sells about 14 sets of rotors each week. If he raises his price by $20, he sells 2 less sets of rotors each week.

a. Write an equation to represent the revenue in this situation.

b. At what price should the mechanic sell the rotors in order to obtain a maximum weekly profit?

c. What is the maximum weekly revenue?

15. Alexis stands in a hole and throws a football upward and out of the hole. The football starts with a velocity of 65 feet per second, and it leaves her hand 30 feet BELOW ground level.

a. Write a quadratic function to represent this situation.

★ *For parts b-d, round answers to 2 decimal places if necessary.*

b. What is the maximum height the stone will reach?

c. After how many seconds will the stone hit the ground?

d. After 2 seconds, what will be the height of the stone?

Name: KEY

Chapter 4 Test Review Packet

Factor each expression completely. Remember: GCF, DOTS, then Tic-Tac-Toe!!

1. $2x^2 - 4x - 6$

GCF: $2(x^2 - 2x - 3)$

T-T-T

x^2	-3	$-2x$
x	$+3$	$-3x$
x	$+1$	$+1x$

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

2. $7x^2 - 28x$

GCF $7x(x-4)$

3. $25x^2 - 50$

GCF $25(x^2 - 2)$

4. $9x^2 - 4$

D.O.T.S. $(3x+2)(3x-2)$

Solve each equation using any method you choose: (Quadratic Formula OR Zero Product Property)

5. $2x^2 + 3x - 8 = 0$

(approx. decimal answers please)

Quad. Formula $a\ 2\ b\ 3\ c\ -8$

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

$$x = \frac{-3 \pm \sqrt{73}}{4}$$

$x = 1.39, -2.89$

6. $(2x - 5)(x - 6) = 0$

Zero Product Property

$2x - 5 = 0$ or $x - 6 = 0$

$2x = 5$ or $x = 6$

$x = 5/2$

7. $(3x-5)(x-2)$

Zero Product Property: $3x-5=0$ or $x-2=0$

$3x=5$ or $x=2$

$x=5/3$ or $x=2$

8. $3x^2+13x+10=0$

(approx. decimal answers please)

$a:3 \quad b:13 \quad c:10$ Quad. Formula

$$x=\frac{-13\pm\sqrt{13^2-4(3)(10)}}{2(3)}$$

$$x=\frac{-13\pm\sqrt{49}}{6}$$

$x=-1$ or $x=-10/3$

Find the discriminant of each quadratic to determine how many solutions it has.

Discriminant: b^2-4ac (the part under the square root)

9. $3x^2-6x+5=0$

$a:3 \quad b:-6 \quad c:5$

discriminant: $(-6)^2-4(3)(5)=-24$

# of solutions: 0 real solutions

could it be factored? Yes or [redacted]

10. $x^2-10=0$

$a:1 \quad b:0 \quad c:-10$

discriminant: $0^2-4(1)(-10)=40$

# of solutions: 2 real solutions

could it be factored? Yes or [redacted]

(not a perfect square)

11. $2x^2-4x+2=0$

$a:2 \quad b:-4 \quad c:2$

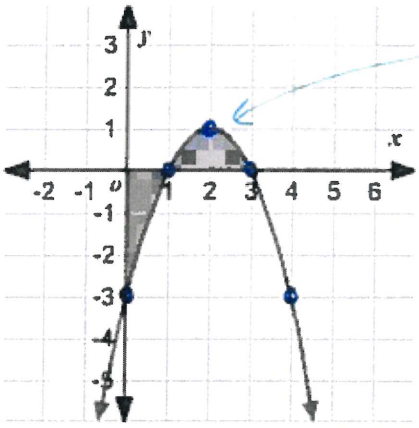
discriminant: $(-4)^2-4(2)(2)=0$

# of solutions: 1 real solution

could it be factored? [redacted]

(0 is a perfect square)

12. A function of x is graphed below.



vertex is (2,1) ; it is upside down (a is negative)

a. Which of these describes the graph?

a. $y = (x+2)^2 - 1$

b. $y = -(x-2)^2 - 1$

c. $y = -(x-2)^2 + 1$

d. $y = (x-2)^2 + 1$

• you could also plug each one @ a time into the y= in calculator

b. What are the x-intercepts (zeros) of the function?

(1,0) ; (3,0)

c. What is the y-intercept of the function?

(0,-3)

d. What is the maximum y-value of the function?

vertex (2,1) → max. y-value is 1

13. A ball is thrown from the top of a tall building. The height, in feet, between the ball and the ground t seconds after it is thrown is given by $h = -16t^2 - 9t + 400$.

• plug equation into y=
• follow steps on cheat sheet

a) How high will the ball be after 4.5 seconds?

(point on graph)

a. 400 feet b. 4.5 feet c. 35.5 feet d. 4.73 feet

b) When will the ball hit the ground?

(x-intercept)

a. 400 feet b. 4.5 feet c. 35.5 feet d. 4.73 feet

14. A mechanic sells rotors for cars for $150, and he usually sells about 14 sets of rotors each week. If he raises his price by $20, he sells 2 less sets of rotors each week.

a. Write an equation to represent the revenue in this situation.

$R = (150 + 20x)(14 - 2x)$

b. At what price should the mechanic sell the rotors in order to obtain a maximum weekly profit?

vertex: $(-.25, 2102.5)$ $150 + 20(-.25) = \$145$

plug into equation!

c. What is the maximum weekly revenue?

$\$2,102.50$

15. Alexis stands in a hole and launches a stone upward and out of the hole. The stone starts with a velocity of 65 feet per second, and it leaves the sling 30 feet BELOW ground level.

a. Write a quadratic function to represent this situation.

$h = -16t^2 + 65t - 30$

★ *For parts b-d, round answers to 2 decimal places if necessary.* → use the calc. cheat sheet

b. What is the maximum height the stone will reach?

vertex: $(2.03, 36.02)$

36.02 feet

c. After how many seconds will the stone hit the ground?

x-intercept: $(3.53, 0)$

3.53 seconds

d. After 2 seconds, what will be the height of the stone?

point: $(2, 36)$

36 feet