

R10 Practice Test

Date \_\_\_\_\_ Period \_\_\_\_\_

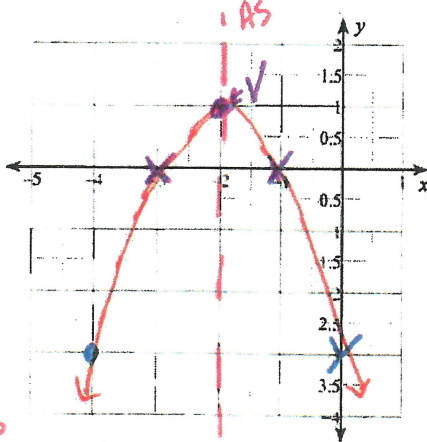
**DIRECTIONS- CLEARLY SHOW WORK TO RECEIVE ANY CREDIT!!!!**

**Solve and check by Graphing.**

- 1) Clearly graph each function and label the graph with key features: Y-INTERCEPT(Y), vertex(V), axis of symmetry (AS), and solutions (X).
- 2) Clearly show calculations for the vertex and axis of symmetry.
- 3) Clearly plot 5 points and provide the table for these points.
- 4) Identify solutions by writing "SOLUTIONS are x=..."

1)  $f(x) = -x^2 - 4x - 3$      $A = -1$     $B = -4$     $C = -3$     2)  $f(x) = x^2 - 2x + 3$

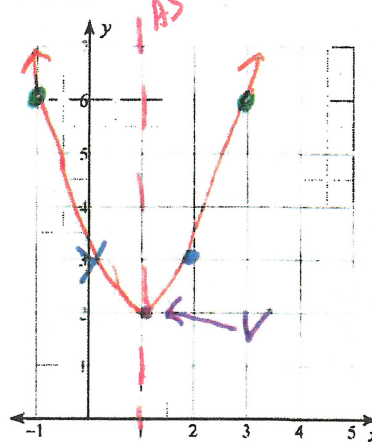
shape  $A = 1$     $B = -2$     $C = 3$     $\downarrow$  y-int  
 (0, 3)



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

x	-4	-3	-2	-1	0
y	-3	0	1	0	-3

**SOLUTIONS**  $x = -3, -1$

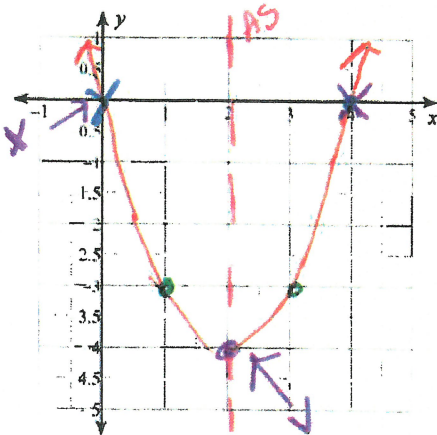


AS  $x = \frac{2}{2(1)} = 1$

x	-1	0	1	2	3
y	6	3	2	3	6

**SOLUTION: X = NO SOLUTION**

3)  $f(x) = x^2 - 4x$      $A = 1$     $B = -4$     $C = 0$



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

x	0	1	2	3	4
y	0	-3	-4	-3	0

**SOLUTION**  
 $x = 0, 4$

**STEP 1: ISOLATE  $x^2$**

Solve each equation by taking square roots.

4)  $100a^2 + 10 = 46$

$$\frac{100a^2}{100} = \frac{36}{100}$$

$$\sqrt{a^2} = \sqrt{\frac{36}{100}}$$

$$a = \pm \frac{\sqrt{36}}{\sqrt{100}}$$

Don't FORGET  $\pm$

$$a = \pm \frac{6}{10} \text{ reduce}$$

$$a = \pm \frac{3}{5} \text{ Keep as simplified fraction}$$

5)  $11 - 49x^2 = 60$

$$\frac{-49x^2}{-49} = \frac{49}{-49}$$

$$\sqrt{x^2} = -1$$

**X = NO SOLUTION**

Cannot take of a Negative Number

**$D = B^2 - 4AC$**

Find the discriminant of each quadratic equation then state the number and type of solutions.

6)  $2n^2 + 8n + 8 = 0$

$$A=2 \quad B=8 \quad C=8$$

$$D = 64 - 4(2)(8)$$

$$D = 0$$

1 Solution

7)  $-6n^2 + n - 9 = 0$

$$A=-6 \quad B=1 \quad C=-9$$

$$D = 1 - 4(-6)(-9)$$

$$D = -215$$

No Real solution

Solve each equation with the Quadratic formula.

$$8) \quad \begin{array}{r} 2x^2 + 4x - 4 = 2 \\ -2 \quad -2 \\ \hline \end{array}$$

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

$$A = 2 \quad B = 4 \quad C = -6$$

$$X = \frac{-4 \pm \sqrt{16 - 4(2)(-6)}}{2(2)}$$

$$X = \frac{-4 \pm \sqrt{64}}{4}$$

$$X = \frac{-4 + 8}{4}$$

$$X = 1$$

$$X = \frac{-4 - 8}{4}$$

$$X = -3$$

$$9) \quad \begin{array}{r} x^2 + 5x - 22 = 2 \\ -2 \quad -2 \\ \hline \end{array}$$

$$x^2 + 5x - 24 = 0$$

$$A = 1 \quad B = 5 \quad C = -24$$

$$X = \frac{-5 \pm \sqrt{25 - 4(1)(-24)}}{2(1)}$$

$$X = \frac{-5 \pm \sqrt{121}}{2}$$

$$X = \frac{-5 + 11}{2}$$

$$X = 3$$

$$X = \frac{-5 - 11}{2}$$

$$X = -8$$

STEP I -  
PUT IN  
STD FORM  
 $Ax^2 + Bx + C = 0$

QF :

$$X = \frac{-B \pm \sqrt{B^2 - 4AC}}{2A}$$

$$10) \quad \begin{array}{r} x^2 - 2 = 2x - 4 \\ -2x \quad -2x \\ \hline \end{array}$$

$$x^2 - 2x - 2 = -4$$

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

$$A = 1 \quad B = -2 \quad C = 2$$

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

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

$X = \text{NO SOLUTION}$

Solve each quadratic equation using any algebraic method (taking square roots, completing the square, quadratic formula, or factoring)

11)  $2 + 4n^2 = 102$  ← NO X TERM  
∴ TAKE SQ ROOTS

$$\begin{array}{r} -2 \quad -2 \\ \hline 4n^2 = 100 \\ \hline 4 \quad 4 \end{array}$$

$$\sqrt{4n^2} = \sqrt{100}$$

$$n = \pm 5$$

12)  $x^2 + 11x + 24 = 0$  ← EASY TO FACTOR

$$(x+3)(x+8) = 0$$

1	24
2	12
3	8
4	6

$$\begin{array}{l} x+3=0 \\ x=-3 \end{array} \quad \begin{array}{l} x+8=0 \\ x=-8 \end{array}$$

13)  $x^2 + 12x = -20$  ← COMPLETE SQUARE

$$\begin{array}{r} +36 \quad +36 \\ \hline \sqrt{(x+6)^2} = \sqrt{16} \\ x+6 = \pm 4 \\ -6 \quad -6 \\ \hline x = -6 \pm 4 \end{array}$$

$$\begin{array}{l} x = -6 + 4 \\ x = -2 \end{array} \quad \begin{array}{l} x = -6 - 4 \\ x = -10 \end{array}$$

14)  $2x^2 - 5x - 3 = 0$  ← QUAD FORMULA

A = 2 B = -5 C = -3

$$x = \frac{5 \pm \sqrt{25 - 4(2)(-3)}}{2(2)}$$

$$x = \frac{5 \pm \sqrt{49}}{4}$$

$$\begin{array}{l} x = \frac{5+7}{4} \\ x = 3 \end{array} \quad \begin{array}{l} x = \frac{5-7}{4} \\ x = -\frac{2}{4} \\ x = -\frac{1}{2} \end{array}$$

15)  $15x^2 = 25x$  ← EASY TO FACTOR

$$\begin{array}{r} -25x \quad -25x \\ \hline 15x^2 - 25x = 0 \\ 5x(3x - 5) = 0 \end{array}$$

$$\begin{array}{l} 5x = 0 \\ x = 0 \end{array} \quad \begin{array}{l} 3x - 5 = 0 \\ +5 \quad +5 \\ \hline 3x = 5 \\ \frac{3x}{3} = \frac{5}{3} \\ x = \frac{5}{3} \end{array}$$

NOTE: You can use any method you want!!

← KEEP AS AN IMPROPER FRACTION

Solve each equation with the quadratic formula. Round 2 decimals. Show the final check step.

16)  $5x^2 - 13 = 9x$

$$5x^2 - 9x - 13 = 0$$

A = 5  
B = -9  
C = -13

$$X = \frac{9 \pm \sqrt{81 - 4(5)(-13)}}{2(5)}$$

$$X = \frac{9 \pm \sqrt{341}}{10} \leftarrow \text{DO NOT ROUND}$$

$$X = \frac{9 + \sqrt{341}}{10}$$

$$X \approx 2.75$$

C:  $24.81 \approx 24.75 \checkmark$

$$X = \frac{9 - \sqrt{341}}{10}$$

$$X \approx -0.95$$

C:  $-8.49 \approx -8.55 \checkmark$

17)  $-3x^2 = 2x - 6$

$$+3x^2 + 3x^2$$

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

A = 3

B = 2

C = -6

$$X = \frac{-2 \pm \sqrt{4 - 4(3)(-6)}}{2(3)}$$

$$X = \frac{-2 \pm \sqrt{76}}{6} \leftarrow \text{DO NOT ROUND}$$

$$X = \frac{-2 + \sqrt{76}}{6}$$

$$X \approx 1.12$$

C:  $-3.76 \approx -3.76 \checkmark$

$$X = \frac{-2 - \sqrt{76}}{6}$$

$$X \approx -1.79$$

C:  $-9.61 \approx -9.58 \checkmark$

18)  $-6x^2 - 12x = -13$

$$+13 \quad +13$$

$$-6x^2 - 12x + 13 = 0$$

A = -6  
B = -12  
C = 13

$$X = \frac{12 \pm \sqrt{144 - 4(-6)(13)}}{2(-6)}$$

$$X = \frac{12 \pm \sqrt{456}}{-12} \leftarrow \text{DO NOT ROUND}$$

$$X = \frac{12 + \sqrt{456}}{-12}$$

$$X \approx -2.78$$

C:  $-13.01 \approx -13 \checkmark$

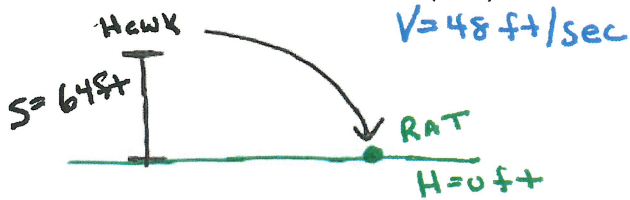
$$X = \frac{12 - \sqrt{456}}{-12}$$

$$X \approx 0.78$$

C:  $-13.01 \approx -13 \checkmark$

A hawk, flying at a height of 64 feet, spots a rat on the ground. If he dives down to catch the rat at a speed of 48 feet per second, how long will it take him to catch the rat?

- 19) (a) Sketch and label the graph. Include units and label the variables. (1PT)



- (b) Write the model for height as a function of time using function notation (2PT)

**Formula**  $H = -16T^2 + VT + S$

Model

$$h(t) = -16T^2 + 48T + 64$$

- 21) Calculate the height of the hawk after 1 second. Clearly show your work. (1PT)

$t = 1$  second  
find height

$$h(1) = -16(1)^2 + 48(1) + 64$$

$$h(1) = -16 + 48 + 64$$

$$h(1) = -16 + 112$$

$$h(1) = 96$$

The hawk will be at 96 ft after 1 second.

- 20) Find the time. Clearly show your work. (2PTs)

$$h(t) = -16T^2 + 48T + 64$$

$$\hookrightarrow 0 = -16T^2 + 48T + 64$$

$$0 = -16(T^2 - 3T - 4)$$

$$0 = -16(T-4)(T+1)$$

$$\begin{array}{ccc} \diagdown & \diagdown & \diagdown \\ -16=0 & T-4=0 & T+1=0 \\ & \textcircled{T=4} & \textcircled{T=-1} \end{array}$$

The hawk will catch the rat on the ground at 4 seconds.