Honors Algebra 1 Name_____ ID: 1

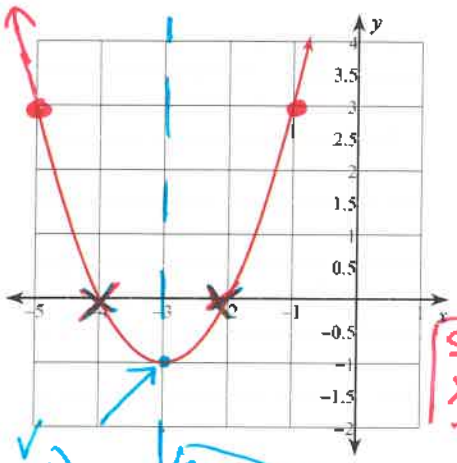
10.3 to 10.6 Solve QE 's (all methods)

Date_____ Period____

Solve and check by Graphing. Clearly graph each function labeling the vertex, A.S., and solutions (x).

1) $f(x) = x^2 + 6x + 8$

A=1 B=6 C=8



AS: $x = \frac{-6}{2(1)} = -3$

Solutions $x = -2, -4$

(-3,-1) ✓

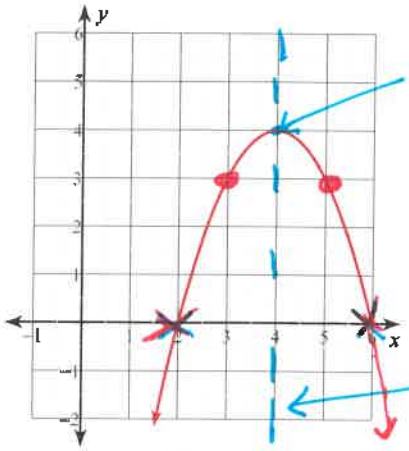
AS $x = -3$

X	-5	-4	-3	-2	-1
Y	3	0	-1	0	3

✓

2) $f(x) = -x^2 + 8x - 12$

A=-1 B=8 C=-12



(4,4) ✓

AS $x = \frac{-8}{2(-1)} = 4$

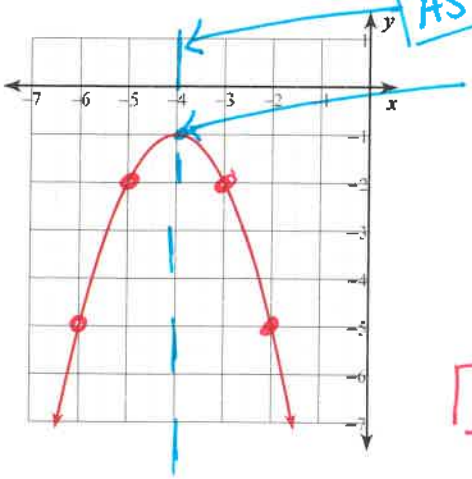
AS $x = 4$

Solutions $x = 2, 6$

X	Y
2	0
3	3
✓ 4	4
5	3
6	0

3) $f(x) = -x^2 - 8x - 17$

A=-1 B=-8 C=-17



AS $x = -4$

✓ (-4,-1)

AS $x = \frac{8}{2(-1)} = -4$

NO SOLUTION

X	-2	-3	✓ -4	-5	-6
Y	-5	-3	-1	-3	-5

Solve each equation by taking square roots.

4) $-4x^2 + 1 = -143$ → $\frac{-4x^2}{-4} = \frac{-144}{-4}$

{6, –6}

5) $-3x^2 + 4 = 41$ → $\frac{-3x^2}{-3} = \frac{37}{-3}$

{x=no real solution

$\sqrt{x^2} = \sqrt{36}$ ← Show taking $\sqrt{}$ → $\sqrt{x^2} = \pm\sqrt{\frac{37}{3}}$

$x = \pm 6$

$x =$ NO SOLUTION

REMEMBER TO CIRCLE SOLUTIONS

Solve each equation by Completing the square.

6) $n^2 - 2n - 80 = 0$ → $n^2 - 2N + \boxed{1} = 80 + 1$

{10, –8}

$\sqrt{(N-1)^2} = \sqrt{81}$

$N - 1 = \pm 9$

$+1 \quad +1$

$N = 1 \pm 9$

$N = 1 + 9$ → $N = 10$

$N = 1 - 9$ → $N = -8$

7) $n^2 + 20n + 68 = 4$ → $N^2 + 20N + \boxed{100} = -64$

{–4, –16}

$\sqrt{(N+10)^2} = \sqrt{36}$

$N + 10 = \pm 6$

$-10 \quad -10$

$N = -10 \pm 6$

$N = -10 - 6$ → $N = -16$

$N = -10 + 6$ → $N = -4$

Solve the equation by completing the square. (Tip: Remember what to do when A NE 1)

8) $7x^2 + 14x - 21 = 0$

$\{1, -3\}$

$\frac{7}{7} \quad \frac{0}{7}$ ⟶ $x^2 + 2x - 3 = 0$

$x^2 + 2x + \boxed{1} = 3 + 1$

$\sqrt{(x+1)^2} = \sqrt{4}$

$x + 1 = \pm 2$

$-1 \quad -1$

$x = -1 \pm 2$

$x = -1 + 2$ → $x = 1$

$x = -1 - 2$ → $x = -3$

Solve each equation with the Quadratic formula.

9) $n^2 - 11n + 32 = 8$

$-8 \quad -8$

$\{8, 3\}$

$n^2 - 11n + 24 = 0$

$A = 1 \quad B = -11 \quad C = 24$

$x = \frac{11 \pm \sqrt{121 - 4(1)(24)}}{2(1)}$

$x = \frac{11 \pm \sqrt{25}}{2}$

$x = \frac{11 + 5}{2}$ → $x = 8$

$x = \frac{11 - 5}{2}$ → $x = 3$

NOTE: IF THIS is NOT A PERFECT SQUARE THEN DO NOT ROUND

EX: $x = \frac{5 + \sqrt{11}}{2}$

$x \approx 4.16$

Round 2 Decimals

10) $x^2 - x - 100 = -10$

$+10 \quad +10$

$\{10, -9\}$

$x^2 - x - 90 = 0$

$A = 1 \quad B = -1 \quad C = -90$

$x = \frac{1 \pm \sqrt{1 - 4(1)(-90)}}{2(1)}$

$x = \frac{1 \pm \sqrt{361}}{2}$

$x = \frac{1 + 19}{2}$ → $x = 10$

$x = \frac{1 - 19}{2}$ → $x = -9$

Solve each equation with the quadratic formula.

11) $-3x^2 - 6 = 0$

$A=-3 \quad B=0 \quad C=-6$

$$x = \frac{-0 \pm \sqrt{0-4(-3)(-6)}}{2(-3)}$$

$$x = \frac{0 \pm \sqrt{-72}}{-6} \rightarrow x = \text{NO SOLUTION}$$

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

12) $2m^2 = 50$

$\{5, -5\}$

SQ ROOTS

$\sqrt{m^2} = \sqrt{25}$

$m = \pm 5$

13) $n^2 + 4n - 21 = 0$

$\{3, -7\}$

FACTOR

$(x+7)(x-3) = 0$

$x+7=0 \quad x-3=0$

$x=-7 \quad x=3$

14) $x^2 + 6x = 27$

$\{3, -9\}$

Complete SQ

$x^2+6x+\boxed{9} = 27+9$

$\sqrt{(x+3)^2} = \sqrt{36}$

$x+3 = \pm 6$

$-3 \quad -3$

$x = -3 \pm 6$

$x = -3+6 \quad x = -3-6$

$x=3 \quad x=-9$

15) $2x^2 - 7x - 4 = 0$

$\{-\frac{1}{2}, 4\}$

QUAD FORMULA

$A=2 \quad B=-7 \quad C=-4$

$$x = \frac{7 \pm \sqrt{49-4(2)(-4)}}{2(2)}$$

$$x = \frac{7 \pm \sqrt{81}}{4}$$

$x = \frac{7+9}{4} \quad x = \frac{7-9}{4}$

$x=4 \quad x=-\frac{1}{2}$

16) $6n^2 + 36n = 0$

$\{-6, 0\}$

FACTOR

$6N(N+6) = 0$

Set each factor = 0 and solve

$\frac{6N}{6} = \frac{0}{6} \quad N+6 = 0$

$N=0 \quad N=-6$