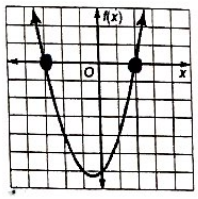
Review for Quadratics Test **Name:**_____

All work must be shown in order to receive any credit.

C 1. The related graph of a quadratic equation is shown below. Use the graph to determine the solutions of the equation.

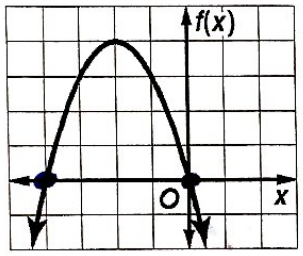
zero
roots
x-intercepts



a. −2, 3
b. 0, −6
c. −3, 2
d. 0, 2

C 2. Identify the quadratic function graphed below.

option #1: Graph each answer
or
option #2: Factor each option



a. $f(x) = x^2 - 4x$ $x(x-4)$ $x=0$ $x=4$
c. $f(x) = -x^2 - 4x$ $-x(x+4)$ $x=0$ $x=-4$
b. $f(x) = -x^2 + 4x$ $-x(x-4)$ $x=0$ $x=4$
d. $f(x) = -(x+4)^2$ $x=-4$

3. Write a quadratic equation with −4 and 7 as its roots. Write the equation in the form $ax^2 + bx + c = 0$, where a, b, and c are integers.

$x=-4$ $x=7$

$(x+4)(x-7)=0$ FOIL!

$x^2-7x+4x-28=0$

$x^2-3x-28=0$

4. Lina and Kristin are solving $x^2 + 2x = 8$. Who is correct? Explain your reasoning.

Didn't set =0?? + use ZPP??

b/c she used ZPP!!

Lina	Kristen
$x^2 + 2x = 8$ ← 0	$x^2 + 2x = 8$
$x(x+2) = 8$	$x^2 + 2x - 8 = 0$
$x = 8$ or $x + 2 = 8$	$(x+4)(x-2) = 0$
$x = 6$	$x+4=0$ or $x-2=0$
	$x=-4$ $x=2$

5. **PHYSICS** The height h (in feet) of a certain rocket t seconds after it leaves the ground is modeled by $h(t) = -16t^2 + 64t + 12$. ~~Write the function in vertex form~~ and find the maximum height reached by the rocket.

2nd calc "max"

(2, 76)

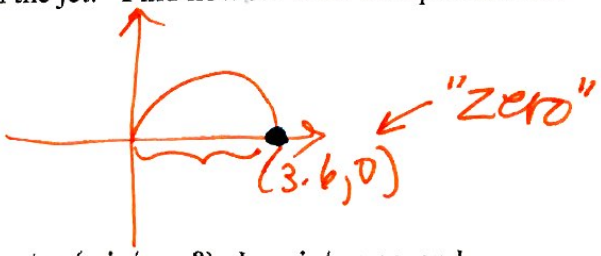
sec feet

76 ft.

6. The path of the water from a sprinkler is modeled by the quadratic function $h(d) = -2d^2 + 6d + 4$, where $h(d)$ is the height of the water, in feet, at a distance d feet from the jet. Find how far from the sprinkler the water hits the ground.

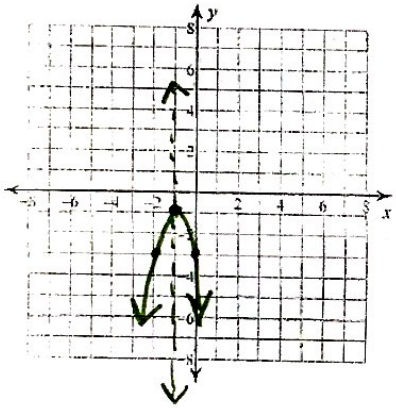
2nd calc "zero"

3.6 ft from the sprinkler



Identify the direction of opening, y-intercept, axis of symmetry, vertex (min/max?), domain/range, and zeros of each. Then sketch the graph.

7) $f(x) = -2x^2 - 4x - 3$



Opens up/down: down

y-intercept: (0, -3)

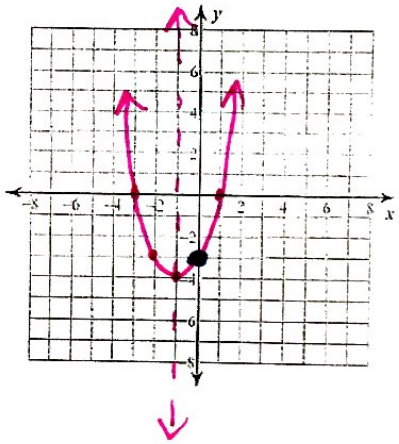
axis of symmetry: x = -1

vertex: (-1, -1) (max/min?)

domain and range: D: ℝ R: y ≤ -1

zeros: none!

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



Opens up/down: up

y-intercept: (0, -3)

axis of symmetry: x = -1

vertex: (-1, -4) (max/min?)

domain and range: D: ℝ R: y ≥ -4

zeros: 1 & -3

2 terms | 3 terms

Solve each equation by factoring: GCF, Difference of 2 Squares, Undo FOIL, ~~Box Method~~ Aussie

9) $n^2+9n=-14$

$+14 \quad +14$

$n^2+9n+14=0$

Reverse FOIL

$-2, -7$

$(n+7)(n+2)=0$ ← Factors

$n+7=0$ $\quad n+2=0$

$n=-7$ $\quad n=-2$ ← solutions

10) $x^2+6x=7$

$-7 \quad -7$

$x^2+6x-7=0$

Reverse FOIL

$-7, 1$

11) $r^2=36$

$-36 \quad -36$

$r^2-36=0$

Diff. of 2 Squares

$6, -6$

$(r+6)(r-6)=0$

$r=-6$ $\quad r=6$

12) $v^2=3v$

$-3v \quad -3v$

$v^2-3v=0$

GCF

$3, 0$

$v(v-3)=0$

$v=0$ $\quad v-3=0$

$v=3$

13) $m^2+42=-13m$

$+13m \quad +13m$

$m^2+13m+42=0$

Reverse FOIL

$-6, -7$

$(m+6)(m+7)=0$

$m=-6$ $\quad m=-7$

14) $6n^2=-4-25n$

$+4+25n \quad +4+25n$

$\frac{6n^2+25n+4=0}{6}$

Aussie

$-\frac{1}{6}, -4$

$n^2+25n+24=0$

$(n+\frac{24}{6})(n+\frac{1}{6})=0$

$(n+4)(6n+1)=0$

$n+4=0$ $\quad 6n+1=0$

$n=-4$ $\quad -1 \quad -1$

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

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

15) $4x^2+35x=-24$

$+24 \quad +24$

$\frac{4x^2+35x+24=0}{4}$

Aussie

$-\frac{3}{4}, -8$

$x^2+35x+96=0$

$24\cdot4$
$48\cdot2$
$16\cdot6$
$32\cdot3$

$(x+\frac{32}{4})(x+\frac{3}{4})=0$

$(x+8)(4x+3)=0$

$x+8=0$ $\quad 4x+3=0$

$x=-8$ $\quad -3 \quad -3$

$\frac{4x=-3}{4 \quad 4}$

$x=-\frac{3}{4}$

Solve each equation by taking square roots.

16) $p^2+7=0$

$-7 \quad -7$

$\sqrt{p^2}=\sqrt{-7}$

$\pm i\sqrt{7}$

$p=\pm i\sqrt{7}$

17) $4p^2-8=124$

$+8 \quad +8$

$\frac{4p^2=132}{4 \quad 4}$

$\sqrt{p^2}=\sqrt{33}$

$\pm\sqrt{33}$

$p=\pm\sqrt{33}$

Solve each equation with the quadratic formula.

18) $2x^2 - x - 66 = 0$ $\quad 6, \frac{-11}{2}$

$a=2$, $b=-1$, $c=-66$

$$x = \frac{1 \pm \sqrt{(-1)^2 - 4 \cdot 2 \cdot (-66)}}{2 \cdot 2}$$

$$= \frac{1 \pm \sqrt{529}}{4}$$

$$= \frac{1 \pm 23}{4}$$

$$= \frac{1+23}{4} = \frac{24}{4} = 6 \qquad \frac{1-23}{4} = \frac{-22}{4} = \frac{-11}{2}$$

19) $3x^2 - 4x + 10 = 0$

$a=3$, $b=-4$, $c=10$

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

$$= \frac{4 \pm \sqrt{-104}}{6}$$

$$= \frac{4 \pm 2\sqrt{26}}{6}$$

$\sqrt{104}$: $\sqrt{4}$ (2), $\sqrt{26}$

$$\frac{2 \pm 1\sqrt{26}}{3}$$

$\frac{12}{-6} = -104$

Solve each equation by completing the square.

20) $x^2 + 14x - 43 = 0$ $\quad -7 \pm 2\sqrt{23}$

$+43 \quad +43$

$x^2 + 14x + \square = 43$

$\frac{14}{2} = 7$, $7^2 = 49$

$x^2 + 14x + 49 = 43 + 49$

$(x+7)(x+7) = 92$

$\sqrt{(x+7)^2} = \sqrt{92}$

$\sqrt{92}$: $\sqrt{4}$ (2), $\sqrt{23}$

$x + 7 = \pm 2\sqrt{23}$

$-7 \quad -7$

$x = -7 \pm 2\sqrt{23}$

21) $p^2 + 2p - 72 = 0$ $\quad -1 \pm \sqrt{73}$

$+72 \quad +72$

$p^2 + 2p + \square = 72$

$\frac{2}{2} = 1$, $1^2 = 1$

$p^2 + 2p + 1 = 72 + 1$

$(p+1)(p+1) = 73$

$\sqrt{(p+1)^2} = \sqrt{73}$

$p + 1 = \pm\sqrt{73}$

$-1 \quad -1$

$p = -1 \pm \sqrt{73}$

22) $m^2 + 12m - 85 = 0$ $\quad 5, -17$