Algebra 1 Review on Quadratic Function Name ans

1) Solve for the roots of $3x^2 - 5x = 2$ using either factoring or quadratic formula

x	#
3	1
1	-2

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

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

$3x+1=0 \qquad x-2=0$

$x = -\frac{1}{3} \qquad x = 2$

$\boxed{\left\{-\frac{1}{3}, 2\right\}}$

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

$x = \frac{5 \pm \sqrt{49}}{6} = \frac{5 \pm 7}{6}$

$x_1 = \frac{5+7}{6} = \frac{12}{6} = \boxed{2}$

$x_2 = \frac{5-7}{6} = \boxed{-\frac{2}{6}}$ or $\boxed{-\frac{1}{3}}$

$\boxed{\left\{2, -\frac{1}{3}\right\}}$

2) Find the roots, in simplest radical form, of $x^2 + 4x = -2$

*(hint: when the question says "**in radical form**," you should use quadratic formula because it means the polynomial can not be factored)*

$\sqrt{8} = \sqrt{4 \cdot 2} = 2\sqrt{2}$

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

$x = \frac{-(4) \pm \sqrt{(4)^2 - 4(1)(2)}}{2(1)} = \frac{-4 \pm \sqrt{8}}{2} = \frac{-4 \pm 2\sqrt{2}}{2}$

$= \boxed{-2 \pm \sqrt{2}}$ ans

3) Given the function $f(x) = 2x^2 + 6x - 1$ (a = 2, b = 6, c = −1)

a) By inspecting the equation, does the graph have a maximum or a minimum? Explain

Since $a=2$, which is positive, so graph is concave up, U. that means it will have a minimum

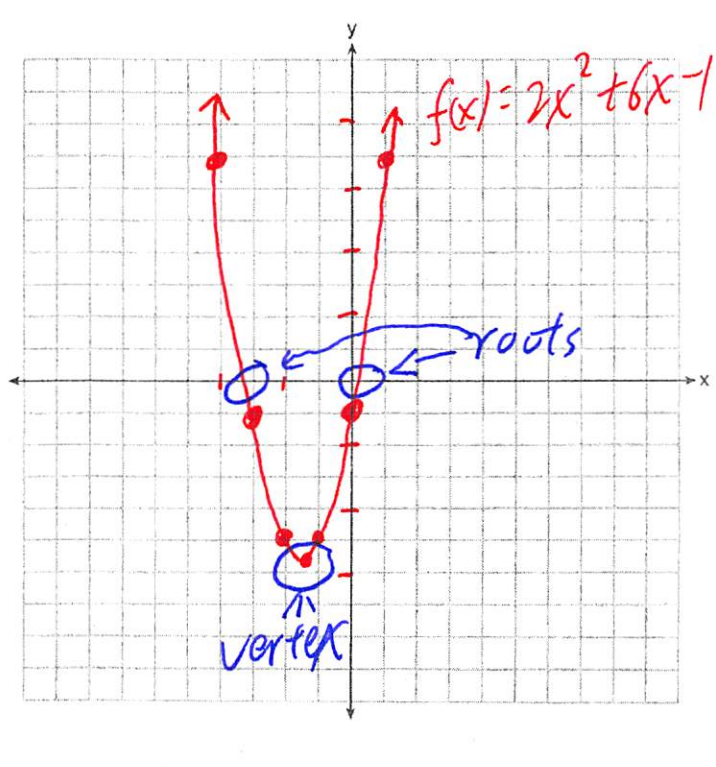
b) sketch the graph of $f(x) = 2x^2 + 6x - 1$

$x = \frac{-b}{2a}$

$x = \frac{-(6)}{2(2)}$

$x = -1.5$

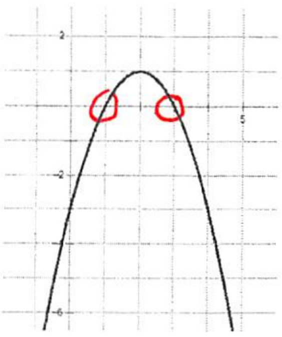
x	y
-4	7
-3	-1
-2	-5
* -1.5	-5.5
-1	-5
0	-1
1	7



c) on your graph, circle the roots, vertex of the graph

d) write the equation of the axis of symmetry $\boxed{x = -1.5}$

4) The graph of a quadratic function, $f(x)$ is given below. Find an equation for $f(x)$



$x_1 = 1, \quad x_2 = 3$

$(x^2 - 4x + 3)$

$\boxed{f(x) = -(x-1)(x-3)}$

or

$\boxed{f(x) = -x^2 + 4x - 3}$

5) After a projectile is launched, its path is modeled by $h(t) = -16t^2 + 96t + 256$, where h is the height, in feet, and t is time measured in seconds.

a) find the height, in feet, of the projectile 4 seconds after its launched

$h(4) = -16(4)^2 + 96(4) + 256$

$\boxed{h(4) = 384}$ feet

b) how many seconds after its launch will the projectile hit the ground? $\Rightarrow h(t) = 0$

$\dfrac{0}{-16} = \dfrac{-16t^2}{-16} + \dfrac{96t}{-16} + \dfrac{256}{-16}$

$0 = t^2 - 6t - 16$

$0 = (t-8)(t+2)$

$t - 8 = 0 \quad | \quad t + 2 = 0$

$t = 8 \quad | \quad t = -2$ rej

8 seconds later it will hit the ground

c) what is the maximum height, in feet, will the projectile reach?

Step 1: $t = \dfrac{-b}{2a} = \dfrac{-(96)}{2(-16)} = 3$

Step 2: $h(3) = -16(3)^2 + 96(3) + 256 = \boxed{400 \text{ feet}}$

Maximum height

6) Find three consecutive positive odd integers such that the product of the smallest (x) and largest $(x+4)$ integers exceed $(+)$ four times of the middle integer by one.

x = smallest integer 3
$x+2$ = middle integer 5
$x+4$ = largest integer 7

$\Rightarrow (x)(x+4) = 4(x+2) + 1$

$x^2 + 4x = 4x + 8 + 1$

$x^2 + \cancel{4x} = \cancel{4x} + 9$

$-4x - 9 \quad -4x - 9$

$x^2 - 9 = 0$

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

rej $x = -3 \quad | \quad x = 3$

$\boxed{\text{The integers are } 3, 5, 7}$