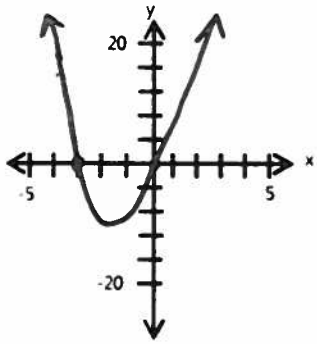
Name: Key

Math 20-1
Quadratic Functions and Equations
Assignment 1: Connecting Zeros, Roots and x-intercepts

1. The graph of a function f is shown.



* copy graph onto your copy.

a. State the x and y intercepts of the graph.

x int: $-3, 0$

y int: 0

b. State the zeros of the function of f

zeros: $-3, 0$

2. Find the roots of the following equations.

a. $2x(x+3)=0$ $2x=0$ $\quad x+3=0$ $x=0$ $\quad x=-3$ roots: $0, -3$	b. $2x^2-10x+12=0$ $2(x^2-5x+6)=0$ $2(x-3)(x-2)=0$ $x=3$ $\quad x=2$ roots: $3, 2$.
c. $x^3+8x^2=20x$ $x^3+8x^2-20x=0$ $x(x^2+8x-20)=0$ $x(x+10)(x-2)=0$ $x=0, -10, 2$ roots: $0, -10, 2$.	d. $4x^2+4x-3=0$ $4x^2+6x-2x-3=0$ $\quad \begin{array}{c\|c} \times & + \\ \hline -12 & 4 \end{array}$ $6, -2$. $2x(2x+3)-1(2x+3)=0$ $(2x-1)(2x+3)=0$ $2x-1=0$ $\quad 2x+3=0$ $x=\frac{1}{2}$ $\quad x=\frac{-3}{2}$ roots: $\frac{1}{2}, \frac{-3}{2}$

3. Find the zeros of the following functions.

a. $f(x) = \frac{x}{3} + 5$ $\frac{x}{3} + 5 = 0$ $\frac{x}{3} = -5$ $x = -15$	b. $g(x) = 25x^2 - 64$ $0 = (5x-8)(5x+8)$ $x = \pm\frac{8}{5}$
c. $P(x) = 3(2x-5)(x+1)$ $2x-5=0$ $\quad x=-1$ $x = \frac{5}{2}$ roots: $-1, 5/2$.	d. $P(x) = x(x-3)(2x+1)$ $0 \quad 3 \quad -\frac{1}{2}$ roots: $-\frac{1}{2}, 0, 3$

4. In each of the following:
   i. Determine the zeros of the function
   ii. Determine the y-intercept of the graph of the function

a. $f(x) = 5x^2 - 35x$ $0 = 5x(x-7)$ i) $0, 7$ ii) $f(0) = 5x^2 - 35x$ $\quad$ yint = $= 5(0)^2 - 35(0) = 0$	b. $f(x) = 3x(x^2 - 49)$ $f(x) = 3x(x-7)(x+7)$ i) $0, \pm 7$ ii) yint → let $x = 0$ $3(0)(0^2-49) = 0$ yint $= 0$
c. $f(x) = 2x^2 - x - 15$ $\quad$ $\times \mid +$ $\quad -30 \mid 2$ $0 = 2x^2 - 6x + 5x - 15$ $0 = 2x(x-3) + 5(x-3)$ $0 = (2x+5)(x-3)$ i) $-\frac{5}{2}, 3$ yint $= -15$	d. $P(x) = 8x^2 + 14x - 15$ $\quad$ $\times \mid +$ $\quad -120 \mid 14$ $\quad 20, -6.$ $0 = 8x^2 - 6x + 20x - 15$ $0 = 2x(4x-3) + 5(4x-3)$ $0 = (2x+5)(4x-3)$ i) $-\frac{5}{2}, 3/4$ ii) -15

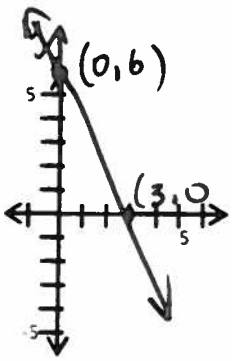
5. Use a graphing calculator to find the zeros (as exact values) of the following functions.

a. $f(x) = 18x^2 - 5x - 7$	b. $g(x) = 3x^3 - 11x^2 + 6x$
graph $y = 18x^2 - 5x - 7$ $x = -0.5, 0.\overline{7}$ $= -\frac{1}{2}, \frac{7}{9}$	graph $y = 3x^3 - 11x^2 + 6x$ $x = 0, \frac{2}{3}, 3$

6. In each case, the graph of the function with $y = f(x)$ is shown. The x and y- intercepts of the graphs are integers. Determine:

- The zeros of the function
- The y-intercept of the graph of the function
- [redacted]

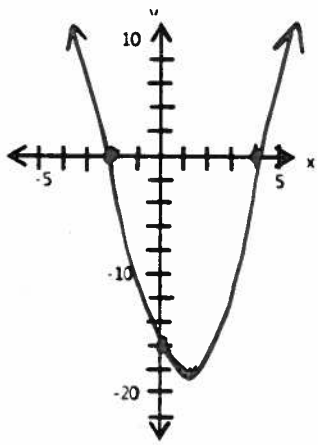
* copy graphs into your file.



zeros: 3

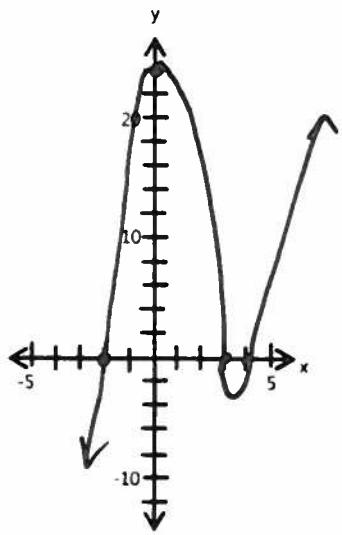
y-int: 6

$y = -2x + 6$



zeros: -2, 4

yint: -16



Zeros: -2, 3, 4

yint: 24

7. Use a graphing calculator to write the equation in factored form.

a. $y = 2x^2 - 3x - 9$

$x_{int} = -1.5, 3$

$= -\frac{3}{2}$

$(x-3) = 0$

$y =$

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

$2x + 3 = 0$

$y = (2x+3)(x-3)$

b. $y = 5x^3 - 7x^2 - 21x - 0$

[redacted]