Math 100
American River College

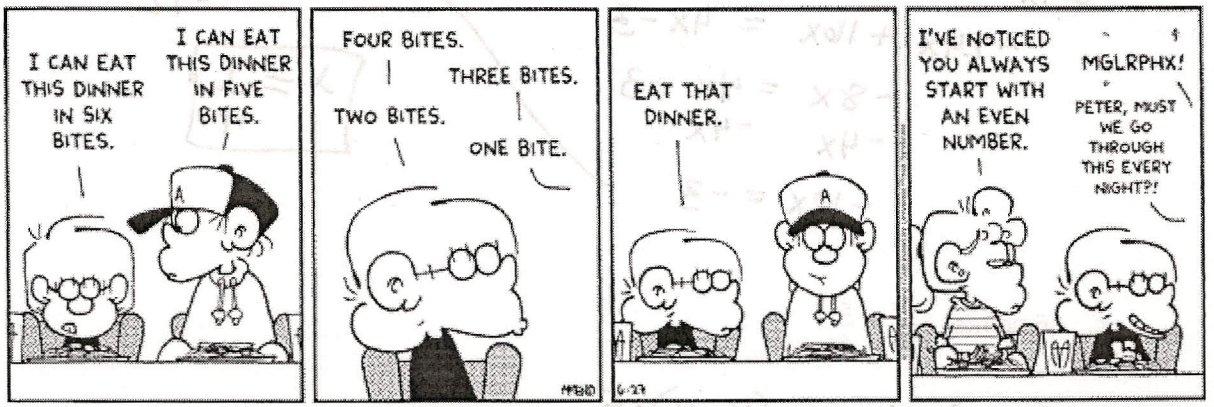
Name: Key

Student ID: _____

Exam 2

PLEASE READ ALL THE DIRECTIONS CAREFULLY

- Show all work. Solutions without proper work will receive no credit.
- Present work in a clear, organized manner.
- No notes, books, or calculators allowed.
- Write answers in **lowest terms** when appropriate
- Good Luck!



Problem	1	2	3	4	5	6	Bonus	Total
Score								
Possible	20	16	10	16	16	22	10	100

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1. (20 points) Solve each equation for x

   a. (6 points) $8(3x+5)-9=9(x-2)+14$

$24x+40-9 = 9x-18+14$

$24x+31 = 9x-4$

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

$15x+31 = -4$

$-31 \quad\quad -31$

$15x = -35$

$x = \frac{-35}{15}$

$x = \frac{-7\cdot 5}{3\cdot 5}$

$\boxed{x = -7/3}$

   b. (8 points) $x+\frac{2}{3}x-2x=\frac{x}{6}-\frac{1}{8}$

LCD: 24

$24\left[x+\frac{2}{3}x-2x\right] = 24\left[\frac{x}{6}-\frac{1}{8}\right]$

$24x+8\cdot 2x-48x = 4x-3$

$-24x+16x = 4x-3$

$-8x = 4x-3$

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

$-12x = -3$

$x = \frac{-3}{-12}$

$\boxed{x = \frac{1}{4}}$

   c. (6 points) $\frac{x+7}{x-4}=\frac{5}{6}$

$(x+7)\cdot 6 = (x-4)\cdot 5$

$6x+42 = 5x-20$

$-5x-42 \quad\quad -5x-42$

$\boxed{x = -62}$

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2. (16 points) Solve the inequalities AND graph the solutions.
   a. (8 points) $x-(2x+5)\geq 7-(4-x)+10$

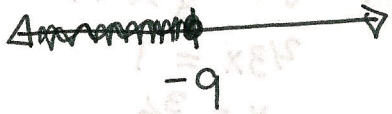
$x-2x-5 \geq 7-4+x+10$

$-x-5 \geq 13+x$

$-5 \geq 13+2x$

$\frac{-18}{2} \geq \frac{2x}{2}$

$-9 \geq x$



   b. (8 points) $0<-\frac{1}{2}x+3\leq 2$

$0 < -\frac{1}{2}x+3 \leq 2$

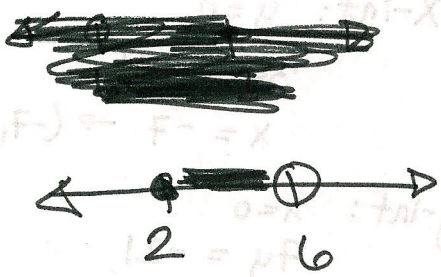
$-3 \quad -3 \quad -3$

$-3 < \left(-\frac{1}{2}x\right) \leq (-1)$

multiply by -2

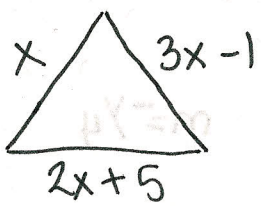
$-3(-2) < (-2)\left(-\frac{1}{2}x\right) \leq (-2)(-1)$

$6 > x \geq 2$



3. (10 points) Three sides of a triangle are x, $3x-1$, $2x+5$. The perimeter of the triangle is 64 inches.
   a. (2 points) Draw a diagram representing the triangle and the given sides.
   b. (4 points) Find the equation for the problem.
   c. (4 points) What are values of the triangle's three sides?

a)



$P=64$

b) $64 = x+3x-1+2x+5$

$64 = 6x+4$

$60 = 6x$

$\boxed{10 = x}$

c) side 1 : $x = 10$ inches

side 2 : $3x-1 = 29$ inches

side 3 : $2x+5 = 25$ inches

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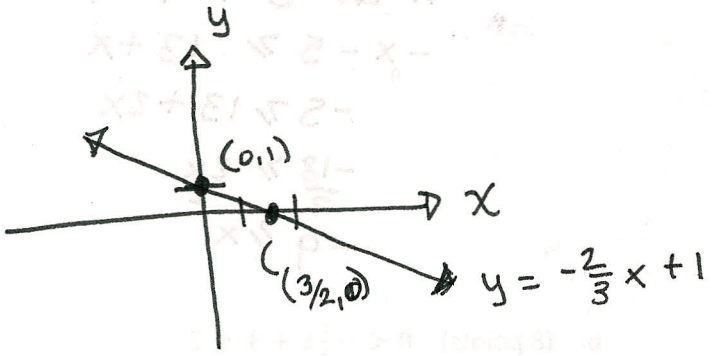
4. (16 points) For the following equations, find the x-intercept and y-intercept. Then graph the equation. Be sure to label the intercepts and lines on your graph.

a. (8 points) $y = -\frac{2}{3}x + 1$

X-int:
$y=0 \rightarrow 0 = -\frac{2}{3}x + 1$
$2/3x = 1$
$x = 3/2$
$(3/2, 0)$

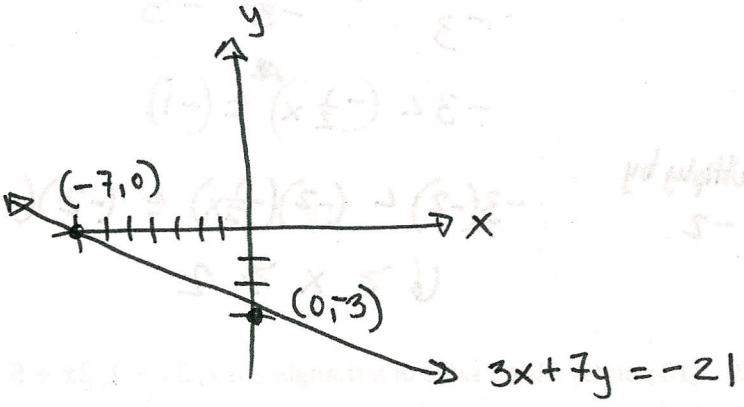
y-int: $(0,1)$



b. (8 points) $3x + 7y = -21$

X-int: $y=0$
$3x = -21$
$x = -7 \rightarrow (-7,0)$

y-int: $x=0$
$7y = -21$
$y = -3$
$(0,-3)$



5. (16 points) Determine if the following sets of equations are parallel, perpendicular, or neither.

a. (8 points) $4y - x = 20$ (1)
$2y + 4x = -6$ (2)

Look at slopes

(1) $4y = 20 + x$
$y = 5 + 1/4x$
$m = 1/4$

(2) $2y + 4x = -6$
$2y = -6 - 4x$
$y = -3 - 2x$
$m = -2$

Neither

b. (8 points) $3x + 12y = 18$ (1)
$4x + 16y = 24$ (2)

(1) $12y = 18 - 3x$
$y = \frac{3}{2} - \frac{1}{4}x$ $m = -1/4$

(2) $16y = 24 - 4x$
$y = \frac{24}{16} - \frac{1}{4}x$ $m = -1/4$

parallel

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6. (22 points) Write the equation of the line in slope-intercept form given the following information.

a. (5 points) $(0, -2)$, $m = \frac{4}{3}$

$y = \frac{4}{3}x - 2$

b. (5 points) $(3, -1)$, $m = 0$

↳ indicates horizontal line

$y = -1$

c. (6 points) $(-3, 4)$, $(6, -14)$

$m = \frac{4+14}{-3-6} = \frac{18}{-9} = -2$

$(y - 4) = (x + 3) \cdot (-2)$

$y - 4 = -2x - 6$

$y = -2x - 2$

d. (6 points) $(-2, 4)$, $(-2, 1)$

↓ x doesn't change, indicates vertical line

$x = -2$

Bonus (10 points) Find three consecutive even integers such that the second added to twice the first is 18 more than the third.

$n, n+2, n+4$

$2n + n+2 = n+4 +18$

$3n + 2 = n + 22$

$2n = 20$

$n = 10$

The three numbers are 10, 12, 14