Below are some of the skills you should have BEFORE entering MTH 95.

Do not use a calculator.

1) Work with positive and negative real numbers, and order of operations.

   Simplify $-5 + (-4)(-3) - 3^2$

2) Simplify expressions:
   a) $3(2x^2 - 3xy + y) - (y - x^2 + 2xy)$
   b) $\dfrac{12a^5b^{-2}}{8a^{-3}b^7}$

3) Expand and collect like terms:
   a) $(3x - 5)(6x + 7)$
   b) $(2x - 3)^2$

4) Factor:
   a) $x^2 - 5x - 14$
   b) $6a^2b^3 - 3a^2b$

5) Solve for x:
   a) $3x - (x + 4) - 5 = 5(x - 4) - 4$
   b) $3x - 5y + 6 = 0$
   c) $x^2 - 5x - 14 = 0$

6) Evaluate expressions:

   If $x = -3$, evaluate $x^2 - 2x - 1$

7) Graph and label three key points:
   a) $4x + 3y = -12$
   b) $y = x^2 - 2x - 8$

8) Find the equation of the line passing through 2 given points:

   $(2, -1)$ *and* $(-1, -7)$

9) Solve a system of equations by all of the following methods: a) substitution, b) elimination/addition, and c) graphically.

Given: $\begin{cases} 2x + y = -3 \\ 3x + 4y = -2 \end{cases}$

10) Solve a first degree inequality in one variable and write your solution using interval notation.

Given: $8 - 5x \geq 3x + 9, \ \ solve\ for\ x$

11) Use a system of equations to solve the following application problem:

How many grams of an alloy that is 80% gold should be melted with 40 grams of an alloy that is 50% gold to produce an alloy that is 70% gold?

12) Evaluate functions:

Given $f(x) = x^2 - 5x + 2, \ evaluate\ f(-2)$

{SOLUTIONS}

R U READY 4 MTH 95?

① $-5+(-4)(-3)-3^2$

$-5+12-9$

$7-9$

$\boxed{-2}$

② $\underline{6x^2}-\underline{9xy}+\underline{3y}-\underline{y}+\underline{x^2}-\underline{2xy}$

$\boxed{7x^2-11xy+2y}$

b) $\dfrac{12a^5b^{-2}}{8a^{-3}b^7} = \dfrac{12a^5a^3}{8b^7b^2}$

$\boxed{= \dfrac{3a^8}{2b^9}}$

3) a) $(3x-5)(6x+7)$

$18x^2+21x-30x-35$

$\boxed{18x^2-9x-35}$

b) $(2x-3)(2x-3)$

$4x^2-6x+9$
$-6x$

$\boxed{4x^2-12x+9}$

4] a) $\dfrac{x^2-5x-14}{(x-7)(x+2)}$ -14, -7, 2, -5

b) $6a^2b^3-3a^2b$

$\boxed{3a^2b(2b^2-1)}$

5] a) $3x-(x+4)-5=5(x-4)-4$

$3x-x-4-5=5x-20-4$

$\underset{-2x}{2x}-9=\underset{-2x}{5x}-24$

$\underset{+24}{-9}=3x\underset{+24}{-24}$

$\dfrac{15}{3}=\dfrac{3x}{3}$

$\boxed{x=5}$

b) $3x-5y+6=0$ -6, $+5y$, $-6+5y$

$\dfrac{3x}{3}=\dfrac{-6+5y}{3}$

$\boxed{x=\dfrac{-6+5y}{3} \text{ or } \dfrac{5y-6}{3}}$

c) $x^2-5x-14=0$

$(x-7)(x+2)=0$

$\boxed{x=7,-2}$

6) x^2-2x-1, if $x=-3$

$(-3)^2-2(-3)-1$

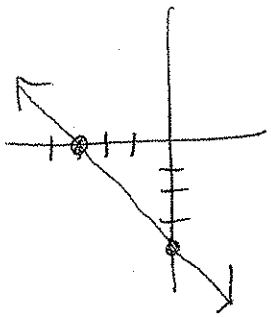
$9+6-1=\boxed{14}$

SOLUTIONS

(M95)

7] a) $4x+3y=-12$

x	y
0	-4
-3	0



b) $y=x^2-2x-8$

VERTEX $\frac{-B}{2A}=\frac{2}{2}=1$ → V(1,-9)

$y=(1)^2-2(1)-8$

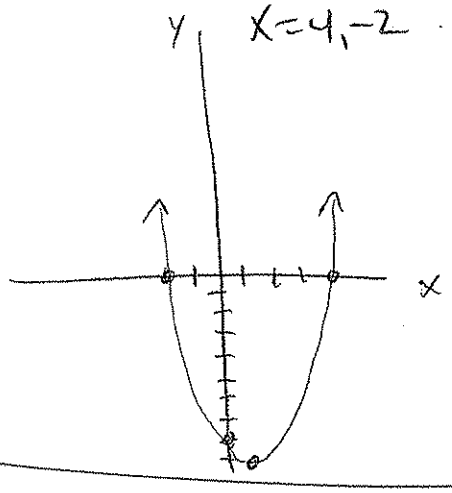
$1-2-8=-9$

y-int → (0,-8)

$y=(0)^2-2(0)-8=-8$

x-int $(x-4)(x+2)=0$ → (4,0) (-2,0)

$x=4,-2$



8] (2,-1) (-1,-7)

$m=\frac{-1-(-7)}{2-(-1)}=\frac{6}{3}=2$

$-1=2(2)+B$

$-1=4+B$

$-4\quad -4$

$B=-5$

$y=2x-5$

ELIMINATION / ADDITION

$[2x+y=-3]\,-4$

$3x+4y=-2$

$-8x-4y=12$

$-5x=10$

$x=-2$

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

$-4+y=-3$

$+4\quad +4$

$y=1$

9] $2x+y=-3$

$3x+4y=-2$

(-2, 1)

SUBSTITUTION

$y=-3-2x$

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

$3x-12-8x=-2$

$-5x-12=-2$

$-5x=10$

$x=-2$

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

$-3+4$

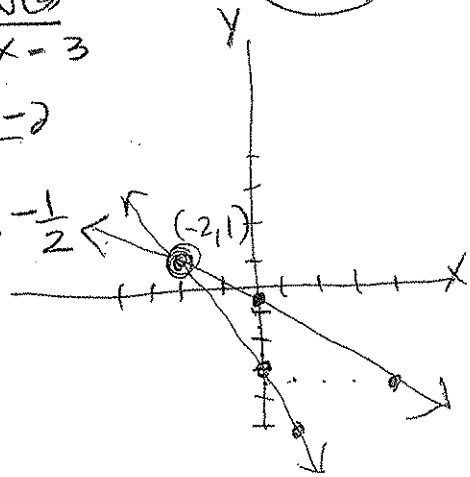
$y=1$

GRAPHING

$y=-2x-3$

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

$y=-\frac{3}{4}x-\frac{1}{2}$



10] $8-5x\geq 3x+9$

$-3x\quad -3x$

$8-8x\geq 9$

$-8\quad -8$

$\frac{-8x}{-8}\geq\frac{1}{-8}$

$x\leq -1/8$

$(-\infty, -1/8]$

{SOLUTIONS}

11] grams / %

x	80%
40	50%
y	70%

$x + 40 = y$

$.8x + .5(40) = .7y$

$.8x + 20 = .7(x+40)$

$.8x + 20 = .7x + 28$

$-.7x \qquad -.7x$

$.1x + 20 = 28$

$-20 \quad -20$

$\frac{.1x}{.1} = \frac{8}{.1}$

$x = 80$

80 grams of alloy

12] $f(x) = x^2 - 5x + 2$

$f(-2) = (-2)^2 - 5(-2) + 2$

$4 + 10 + 2 = 16$