Midterm Review

25.)

x	y
-3	7
3	3

-4 / +6

$m = \frac{-4}{6} = \frac{-2}{3}$

$y = mx + b$

$3 = -\frac{2}{3}(3) + b$

$3 = -2 + b$

$+2 \quad +2$

$5 = b$

$y = -\frac{2}{3}x + 5$

26.) algebraically

$4x - 2y = 10$

$-4x \quad -4x$

$\frac{-2y}{-2} = \frac{-4x + 10}{-2}$

$y = 2x - 5$

$m = \frac{2}{1}$

$b = -5$

$y + 2x = -1$

$-2x \quad -2x$

$y = -2x - 1$

$m = \frac{-2}{1}$ ↓ →

$b = -1$

solution $(1, -3)$

graphically

x	y_1 line	y_2 line
0	-5	-1
1	-3	-3
2	-1	-5
3	1	-7

27.) $y = x^2 - 5x + 3$

x	y
-1	9
0	3
1	-1
2	-3
2.5	-3.25
3	-3
4	-1

$y + 6 = x$

$-6 \quad -6$

$y = x - 6$

$m = \frac{1}{1}$

$b = 6$

$(3, -3)$

28) $y > 4x - 1$

$m = \frac{4}{1}$

$b = -1$

shade above

dotted line

$2x + y \leq 5$

$-2x \quad -2x$

$y \leq -2x + 5$

$m = -2$

$b = 5$

solid line

shade below

(,)

29) no, #1, 3, & 4 are not equations b/c they do not have equal signs.

30) Let x = 1st CI

$x + 1$ = 2nd CI

The #s are -7 & -6.

$x(x+1) = 42$

$x^2 + x = 42$

$-42 \quad -42$

$x^2 + x - 42 = 0$

$(x+7)(x-6) = 0$

$x = -7$ | $x = 6$ reject

31) Let

smaller # = x

larger # = $2x + 5$

$x(2x+5) = 52$

$2x^2 + 5x = 52$

$-52 \quad -52$

$2x^2 + 5x - 52 = 0$

-104 / -8 X 13 / 5

small # is 4 & the larger # is 13.

	x	-4
$2x$	$2x^2$	$-8x$
$+13$	$+13x$	-52

$= 0$

$(x-4)(2x+13) = 0$

$x = 4$ | $2x + 13 = 0$

$x = -13$ reject

$2(4) + 5$

$8 + 5$

13

32) Let x = # dimes
y = # nickels

$-5(x+y=15)$
$10x+5y=135$

$-5x-5y=-75$
$10x+5y=135$
$5x=60$
$x=12$

12 dimes & 3 nickels

$x+y=15$
$12+y=15$
$y=3$

33) Let x = # markers
y = # pencils

$-3(3x+2y=1.80)$
$4x+6y=2.90$

$-9x-6y=-5.40$
$4x+6y=2.90$
$-5x=-2.5$
$x=0.50$

$3x+2y=1.80$
$3(0.5)+2y=1.80$
$1.5+2y=1.80$
$-1.5 \quad -1.5$
$2y=0.3$
$y=0.15$

$0.50 for markers & $0.15 for pencils

34) $5x^2+28x-12=0$

-60
$-2 \quad 30$
28

	x	$+6$
$5x$	$5x^2$	$+30x$
-2	$-2x$	-12

$=0$

$(x+6)(5x-2)=0$

$x=-6$ | $5x-2=0$
$x=\frac{2}{5}$

$\{-6, \frac{2}{5}\}$

35) $y = 3x^2 - 2x - 6$

$a = 3$
$b = -2$
$c = -6$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(3)(-6)}}{2(3)}$$

$\frac{\sqrt{76}}{2}$
$\sqrt{4 \cdot 19}$ answer

$$\left\{ x = \frac{2 \pm \sqrt{76}}{6} \right\} = \frac{2 \pm 2\sqrt{19}}{6} = \left\{ \frac{1 \pm \sqrt{19}}{3} \right\}$$

36) $x = -5 \quad x = \frac{4}{3}$

$(x+5)(x - \frac{4}{3}) = 0$

$(x+5)(3x-4) = 0$

multiply

$y = 3x^2 - 4x + 15x - 20$

$y = 3x^2 + 11x - 20$

37) $8x^2 + 5x - 2$
$-2x^2 + 3x - 2$
$6x^2 + 8x - 4$

38) Let 1st # = $x = 11$ mean avg
2nd # $= 2x - 4 = 2(11) - 4 = 18$
3rd # $= 4x + 2 = 4(11) + 2 = 46$

$$\frac{x + 2x - 4 + 4x + 2}{3} = \frac{25}{1}$$

$7x - 2 = 75$
$+2 \quad +2$
$\frac{7x}{7} = \frac{77}{7}$ $x = 11$

39.) $y = x^2 + 4x + 6$

$y = 2x + 6$

$x^2 + 4x + 6 = 2x + 6$

$-2x - 6 \quad -2x - 6$

$x^2 + 2x = 0$

$x(x+2) = 0$

$x = 0 \quad x = -2$

2 solutions

$x = 0$	$x = -2$
$y = 2x + 6$	$y = 2x + 6$
$y = 2(0) + 6$	$y = 2(-2) + 6$
$y = 6$	$y = -4 + 6$
(x, y)	$y = 2$
$(0, 6)$	$(-2, 2)$

40.) $V = s^3$

$V = (7x-2)(7x-2)(7x-2)$

$= (49x^2 - 28x + 4)(7x - 2)$

$V =$

	$49x^2$	$-28x$	$+4$
$7x$	$343x^3$	$-196x^2$	$+28x$
-2	$-98x^2$	$+56x$	-8

$= 343x^3 - 294x^2 + 84x - 8$

41.) $m = \frac{2}{7}$

$b = -3$

dotted line } $<$
shade below }

$y < 2x - 3$

42.) $7x + 16 = 3x + 48$

$-3x \quad -3x$

$4x + 16 = 48$

$-16 \quad -16$

$\frac{4x}{4} = \frac{32}{4}$

$x = 8$

43.) Let nickels $= x - 5 = 13$ } ans
dimes $= x = 18$ }
Quarters $= x + 3 = 21$ }

$x - 5 + x + x + 3 = 52$

$3x - 2 = 52$

$+2 \quad +2$

$\frac{3x}{3} = \frac{54}{3}$

$x = 18$

$18 + 3 = 21$

$18 - 5 = 13$

44) let x = # miles

$2.25 + 3.5x = 44.25$

$-2.25 \quad -2.25$

$\frac{3.5x}{3.5} = \frac{42}{3.5}$

$x = 12$

ans: 12 miles

a

b:

c

45) let x = # 2pt questions (ans: 35)

y = # 5pt questions (ans: 15)

$-2(x + y = 50)$

$2x + 5y = 145$

$-2x - 2y = -100$

$2x + 5y = 145$

$\frac{3y}{3} = \frac{45}{3}$

$y = 15$

$x + y = 50$

$x + 15 = 50$

$-15 \quad -15$

$x = 35$

46) let x = # $2.50 seats

y = # $10.50 seats

$-2.5(x + y = 78)$

$2.5x + 10.5y = 483$

$-2.5x - 2.5y = -195$

$2.5x + 10.5y = 483$

$\frac{8y}{8} = \frac{288}{8}$

$y = 36$

$x + y = 78$

$x + 36 = 78$

$-36 \quad -36$

$x = 42$

42 → $2.50 seats

36 → $10.50 seats

47) $x = -4 \quad x = \frac{1}{2}$

$(x+4)(x - \frac{1}{2}) = 0$

$(x+4)(2x-1) = 0$

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

$y = 2x^2 + 7x - 4$