MS Algebra 1 Midterm Review Name Key

Order of Operations

Evaluate each using the order of operations.

a) $4 + 2 \times 12 \div 6 - 8 =$ 0

$4+24\div6-8$

$4+4-8$

b) $9 \div 3 + 6 \times 2 =$ 15

$3+12=$

c) $3 + 4 - 6 + 2 \times 35 =$ 71

$3+4-6+70$

Expressions and Equations

Solve each equation.

a) $4x - 12 = 64 + 2x$

$2x = 76$

38

b) $-10 + 4(3x + 10) = 18$

$-10+12x+40=18$

$30+12x=18$

$12x=-12$

$x=-1$

Simplify each expression.

a.) $\frac{1}{3}(9x - 30y) + \frac{4}{5}(-5x + 10y)$

$3x-10y-4x+8y$

$-x-2y$

b) $\frac{-1}{4}(-12x + 8y) - \frac{1}{2}(-4x + 2y)$

$3x-2y+2x-y$

$5x-3y$

c) $2\left[8\left(\frac{1}{2}a - b\right) + 3(3a - b)\right]$

$2[4a-8b+9a-3b]$

$2(13a-11b)$

$26a-22b$

d) $(3x - 6z)2 + 13z$

$6x-12z+13z$

$6x+z$

Evaluating Functions

If $f(x) = 3x - 2$ and $g(x) = \frac{1}{2}x^2$, evaluate the following:

a) $f(0)$ -2

b) $f(-1)$ $-3-2=-5$

c) $g(4)$ $\frac{1}{2}(4)^2=\frac{1}{2}(16)=8$

d) $g(-1)$ $1/2$

Systems of Equations and Inequalities

1. Find the slope and the y-intercept of the line $3y - 5x = 9$

$3y=5x+9$

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

$m=5/3$

$b=3$

2. Solve by graphing.

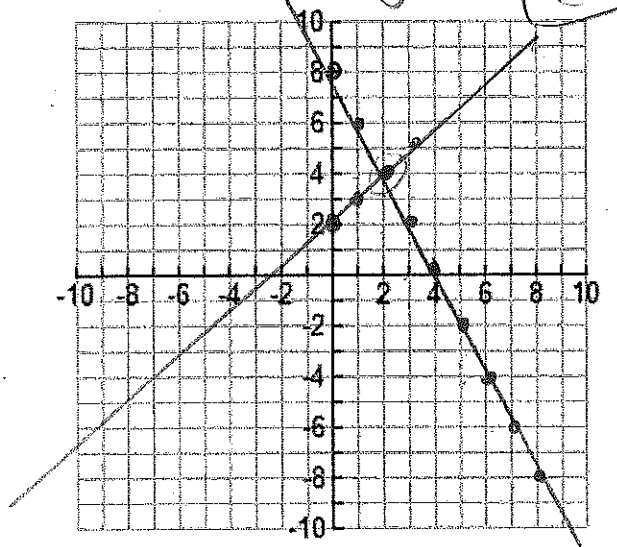
$2x + y = 8$

$y - x = 2$

$y = -2x + 8$

$y = x + 2$

(2, 4)



3. Solve by graphing.

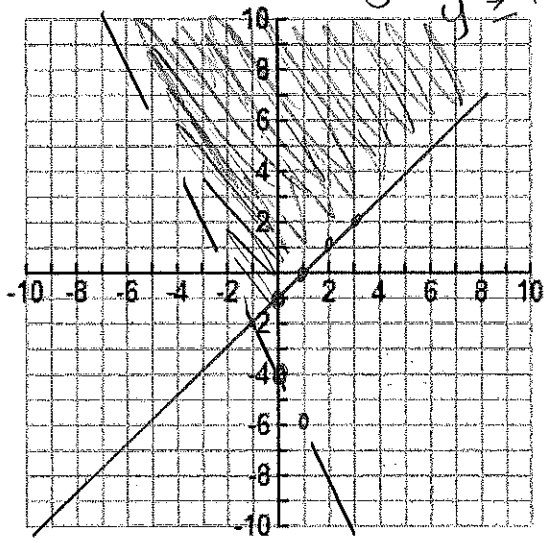
$2x + y > -4$

$x - y \leq 1$

$y > -2x - 4$

$-y \leq -x + 1$

$y \geq x - 1$



3. Solve each system using either substitution or elimination.

a) $2x - 5y = -51$, $y = -6x + 7$

(-1/2, 10)

$-6(-1/2) + 7 = 3 + 7 = 10$

$2x - 5(-6x + 7) = -51$

$2x + 30x - 35 = -51$

$32x = -16$ $x = -1/2$

b) $y = x + 3$, $3x - y = 7$

(5, 8)

$3x - (x + 3) = 7$

$3x - x - 3 = 7$

$2x = 10$

$x = 5$

c.) $-4x + 9y = 9$, $3(x - 3y = -6)$

(9, 5)

$-4x + 9y = 9$

$3x - 9y = -18$

$-x = -9$ $x = 9$

$9 - 3y = -6$

$-3y = -15$

$y = 5$

d.) $-3(5x + 4y = -14)$, $5(3x + 6y = 6)$

$-15x - 12y = 42$

$15x + 30y = 30$

$18y = 72$

$y = 4$

$3x + 24 = 6$

$3x = -18$

$x = -6$

(-6, 4)

e) There are 688 freshmen and sophomores at DHS. There are 22 more freshmen than sophomores. How many freshmen and sophomores are there?

$x + y = 688$

$y + 22 = x$

$y + 22 + y = 688$

$2y = 666$

$y = 333$

355 freshmen

333 sophmores

Exponential Functions

Simplify each using rules of exponents.

a) $\left(\frac{2x^3y^2}{3xy}\right)^{-3}$

$\left(\frac{2x^2y}{3}\right)^{-3}$

$\left(\frac{3}{2x^2y}\right)^{3} = \frac{27}{8x^6y^3}$

b) $(-3a^3)^3 \cdot (4a)^0$

$-27a^9$

c) $\frac{15x^3z^{-5}}{25y^{-4}}$

$\frac{3x^3y^4}{5z^5}$

Solve.

235 years

d) If you invested a penny on Jan 1, 1776 at 10% interest compounded daily, how much would you have on Jan 1, 2011?

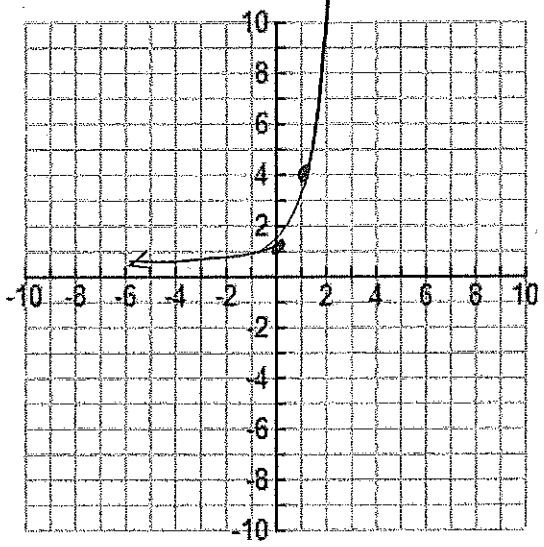
$A = .01\left(1 + \frac{.10}{365}\right)^{(365 * 235)}$ 160,148,364.3

e) You buy a car for $8000 that depreciates at a rate of 11% a year. How much is the care worth after 5 years?

$Y = 8000(1 - .11)^5 = 4467.25$

f) Graph $f(x) = 4^x$

x	y
0	1
1	4
2	16



Polynomial Operations

Perform the indicated operation.

a) $(19x^2 + 12x + 12) + (7x^2 + 10x + 13)$

$16x^2 + 22x + 25$

b) $(4x^2 - 6x + 7) + (-19x^2 - 15x - 18)$

$-15x^2 - 21x - 11$

c) $(6x + 14) - (9x + 5)$

$-3x + 9$

d) $(19x^2 + 9x + 16) - (5x^2 + 12x + 7)$

$14x^2 - 3x + 9$

e) $6(x^2 + 2x + 7)$

$6x^2 + 12x + 42$

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

$-x^3 - 5x^2$

g) $3x^2(4x^3 - 5x + 10)$

$12x^5 - 15x^3 + 30x^2$

h) $3x(-x^2 + 2x - 12)$

$-3x^3 + 6x^2 - 36x$

Correction
Factoring polynomials
Letter a

i) $(x-3)(x+4)$

x^2+x-12

j) $(2x+4)(2x+3)$

$4x^2+6x+8x+12$

$4x^2+14x+12$

k) $(x-7)(x-6)$

$x^2-13x+42$

l) $(3x-1)(x+5)$

$3x^2+15x-x-5$

$3x^2+14x-5$

m) $(x+5)(x^2-6x+3)$

x^3-6x^2+3x
$+5x^2-30x+15$

$x^3-x^2-27x+15$

n) $(2x-3)(4x^2+8x-2)$

$8x^3+16x^2-4x$
$-12x^2-24x+6$

$8x^3+4x^2-28x+6$

Factoring Polynomials

Factor each polynomial completely.

4.3

* a) $3w^2-zw^2-3+w$ → z

Prime

b) $2t^2+5t-12$

$(2t-3)(t+4)$

c) $4x^2+6x+2$

$2(2x^2+3x+1)$

$2(2x+1)(x+1)$

d) $72-2x^2$

$2(36-x^2)$

$2(6-x)(6+x)$

e) $16x^2+24x+9$

$(4x+3)^2$

f) $4x^4-38x^3+48x^2$

$2x^2(2x^2-19x+24)$

$M(48)$ $A(-19)$

$16 \quad 3$

$2x^2-16x-3x+24$

$2x(x-8)-3(x-8)$

$2x^2(2x-3)(x-8)$

a) $3w^2-zw^2-3+z$

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

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

$(w-1)(w+1)(3-z)$