Problem Set #3

Section A

Simplify.

1) $X + X$
2) $X \cdot X$
3) $X \cdot X \cdot X \cdot X \cdot X$
4) $X \div X$
5) $5X - B + X - B - Y$
6) $-3X - 7 - X + 9$
7) $-8 - 2 + 6 - 7 + 4$
8) $-5 + -9X - +7 - -2X$
9) $(-4)^2$
10) $(-4)^3$
11) $(-4)^4$
12) $30 \div 8 \div 4$
13) $10 - 8 \cdot 10^3 \div 4 \cdot 2$
14) Which fraction isn't equal to the others?

(a) $\frac{3}{-7}$ (b) $\frac{-3}{7}$ (c) $\frac{-3}{-7}$ (d) $-\frac{3}{7}$

Evaluate each expression given

$X = -2$; $Y = -10$; $Z = -5$

15) $X^2 + 2Y - 3Z$
16) $Y^2 - 5Z$
17) $-Y^2 - 5Z$
18) $4X - 2YZ + 3Z^2$

Solve.

19) a) $-X - 5 = -1$
    b) $-6X + 3 = -15X$
20) $36X + 7 = 12X - 5$
21) a) $\frac{X}{-5} = -30$
    b) $\frac{3}{5}X = -9$
22) $3(X + 2) + 5 = 1 - (X + 1)$

Section B

Solve.

23) a) $-4X = -\frac{2}{5}$
    b) $\frac{8}{9} = \frac{12}{X}$
24) a) $\frac{8X}{15} = -\frac{12}{5}$
    b) $\frac{-2}{X} = \frac{3}{X-5}$

25) $4X - 8 - 10 - 6X = -7 - 3X - 3 + 22$
26) $4X + 4 + 2(X - 3) = 10 - 6(3X + 4) + 5 - (4X - 7)$
27) $1\frac{1}{3}X - 3¼ = 5X + 4½$

Problem Set #8 (for groups!)

1) Fill in all of the tables on the next page starting with N = 1 and going down to N = 10.

2) Use the tables to answer the following questions:
   a) What is 3^7? b) What is 5^6?
   c) What is 2^{10}? d) What is 10^5?

3) On the three's table, every time you move down one step, the answer gets multiplied by 3. Answer the following:
   a) What happens when you move *down* one step on the five's table?
   b) What happens when you move *up* one step on the five's table?
   c) Given that the five's table says that $5^1 = 5$, what is the answer when you move one step up to 5^0? And another step up to 5^{-1}?

4) Fill in each of the tables starting with N = 0 and going up to N = –5. Leave your answers as fractions. (You shouldn't have to do any calculations.)

5) Given what you now know, complete each of the following statements:
   a) Anything to the zero power equals…
   b) Anything to a negative exponent is the same as…

6) Find the values of each of the following:
   a) 7^{-2} b) 8^0 c) 2^{-10}

7) Rewrite each expression without using a negative exponent:
   a) x^{-5} b) $5x^3y^{-4}$ c) $\frac{3x^{-4}}{5x^3}$

Problem Set #9

Section A

Factor.

1) $x^2 - x - 20$
2) $x^2 + 6x - 36$
3) $18x^2 + 31x + 6$
4) $14x^2 + 13x - 12$
5) $x^2 - 225$
6) $x^2 + 225$
7) $x^2 + 9x - 20$
8) $5x^5 + 20x^3$

Multiply.

9) $(x^3 - 6)(x^3 + 6)$
10) $(x^3 + 6)^2$
11) $(x - 40)^2$

Solve.

12) $x^2 - 7x - 30 = 0$
13) $x^2 + 25 = 10x$
14) $7 + 2x = 8x + x^2$
15) $x^2 + 5x = 6$
16) $x^2 + 5x + 6 = 0$
17) $x^2 + 5x + 6 = 2$
18) $x^2 + 5x + 6 = -2x$
19) $x^2 + 5x + 6 = 2x^2$
20) $x^2 - 54 = 25x$
21) $2x^2 - 108 = 50x$
22) $4(3x - 2) = 12x - 8$

Section B

Multiply.

23) $4x^3(x + 3)(x - 3)$
24) $(3x - 4y^3)^2$
25) $(x^{10}+100)(x^5+10)(x^5-10)$

Factor.

26) $x^9 - x$
27) $12x^3y^5 - 4x^2y^3$
28) $10x^3 + 10x^2 - 200x$
29) $8x^2y^5 + 24x^5y^2$
30) $8x^2y^5 + 24x^2y^5$
31) $x^{12} - 625$
32) $18x^2 + 12x - 6$
33) $18x^2 - 21xy + 6y^2$
34) $18x^6 - 107x^3 - 6$

Solve.

35) $13 - (x + 3)^2 = 12$
36) $5x^2-8x+3=x^2+12x-21$
37) $7x^2 + 3 = x^2 + 19x - 12$
38) $x^2 - 56 = (x + 2)(x - 8)$
39) $2x^2 - 56 = (x + 2)(x - 8)$

Homework

Solve by completing the square.

3) $x^2 + x - 5 = 0$
4) $6x^2 - 19x + 10 = 0$
5) $3x^2 + 4x + 5 = 0$
6) $3x^2 + 4x - 5 = 0$

Word Problems

7) The length of a rectangle is 3m more than the width. What are the dimensions if the perimeter is 15m?
8) Find the width of a rectangle if twice the width is six feet more than the length, and the area is 80 ft^2.
9) A rectangle has a length of 18 inches and a height equal to the length of the side of a square. Find the side of the square such that the rectangle has an area that is 80 square inches greater than the square.

Problem Set #10

Group Work

Solve the equation using each of three methods:

a) Factoring.
b) Completing the Square.
c) The Quadratic Formula.

1) $x^2 + 9x + 20 = 0$
2) $6x^2 + 7x - 10 = 0$

Homework

Solve by using each of the three methods:

3) $x^2 - 6x - 16 = 0$

Solve by quadratic formula:

4) $3x^2 - 8x + 4 = 0$

Solve by the easiest method:

5) $x^2 + 9x + 14 = 0$
6) $x^2 + 5x - 11 = 0$
7) $3x^2 + 10x + 8 = 0$
8) $5x^2 + 7x - 10 = 0$
9) $x^2 + 6x = 3$

Word Problems

10) The length of a rectangle is 6 inches less than four times the width. If the perimeter is 23 inches, then what are the dimensions?

Problem Set #11

Homework

1) Give the Quadratic Formula.
2) The Quadratic Formula is the solution to what equation?
3) Give the proof of the quadratic formula.

Solve the equation using each of the three methods (as stated on the previous set):

4) $x^2 - 7x + 12 = 0$