

## 9<sup>th</sup> Grade Assignment – Week #34

### Group Assignment:

#### *For Tuesday*

- Do these problems:  
**Fractions & Square Roots – Problem Set #5:** Problems #1-5, 20, 21, 24  
**Fractions & Square Roots – Problem Set #6:** Problems #1-6, 19, 20, 24

#### *For Thursday*

- Do these problems:  
**Fractions & Square Roots – Problem Set #7:** Problems #1, 13, 16, 18, 23
- *Puzzle!* John, Kevin, and Stacy need to split a pile of logs. If all three of them work together, it would take them  $1\frac{1}{2}$  hours to do the whole pile. If Kevin and Stacy do it together (without John), then it would take 2 hours. How long would it take John to do it on his own?

### Individual Work

- As much as possible, do the problems from **Fractions & Square Roots – Problem Sets #5, #6, #7** that either weren't assigned for group work, or that your group didn't complete.

Additionally... (If you or your group has extra time and desire)

- Work on **Possibility & Probability – Problem Set #6.**

## Problem Set #5

### Group Work

**Simplify.**

- 1)  $(2 + \sqrt{3})(7 + \sqrt{3})$
- 2)  $(4 + 3\sqrt{2})(5 - \sqrt{2})$
- 3)  $(3 + \sqrt{5})^2$
- 4)  $(5 - 4\sqrt{3})^2$
- 5)  $(3 - \sqrt{2})(3 + \sqrt{2})$

### Homework

**Simplify.**

- 6)  $\sqrt{50} + \sqrt{18}$
- 7)  $(6 + \sqrt{3})(2 + \sqrt{3})$
- 8)  $(6 + \sqrt{2})(2 + \sqrt{3})$
- 9)  $(2 + \sqrt{7})^2$
- 10)  $(3 - 2\sqrt{5})^2$
- 11)  $(5 - \sqrt{3})(5 + \sqrt{3})$
- 12)  $\frac{4}{3\sqrt{5}}$
- 13)  $\frac{5}{3 + \sqrt{2}}$
- 14)  $\frac{3}{4x^2y} - \frac{1}{3xy^3}$
- 15)  $\frac{4}{x^3} + \frac{2}{x^2y^2} - \frac{1}{y^2}$

16)  $\frac{4}{x-5} + \frac{1}{5-x}$

17)  $\frac{2x}{x-3} - \frac{3}{x+3}$

18)  $xy^{-1} + x^{-1}y$

19)  $\frac{6x-5}{5-6x}$

20)  $\frac{4x^3 - 20x^2}{25 - x^2}$

21)  $\frac{3x^2 + 6x}{4 - x^2}$

22)  $\frac{2}{2 - \frac{2}{2 - \frac{1}{2}}}$

23)  $\frac{\frac{x}{x+y} + \frac{y}{x-y}}{\frac{x}{x-y} - \frac{y}{x+y}}$

**Solve.**

24)  $\frac{1}{x} + \frac{1}{x+5} = \frac{1}{6}$

25)  $2 - \frac{5}{x^2-x-6} = \frac{x+3}{x+2}$

26) The difference of two numbers is  $\frac{5}{12}$  and their product is 6. Find the two numbers.

## Problem Set #6

### Group Work

#### Simplify.

- 1)  $\frac{\sqrt{21}}{\sqrt{15}}$
- 2)  $\frac{6}{5\sqrt{2}}$
- 3)  $\frac{6}{5 + \sqrt{2}}$
- 4)  $\frac{3 - \sqrt{2}}{5 + \sqrt{2}}$
- 5) Let  $x = 4 - \sqrt{3}$  and  $y = 4 + \sqrt{3}$ .  $x$  and  $y$  are called *conjugates*. Find:
  - a)  $x$  and  $y$  on a calculator.
  - b)  $x + y$
  - c)  $x \cdot y$
  - d) What is special about conjugates?
- 6) Find the common solution to
 
$$3x - y = 12$$

$$2y - x^2 + 6x = 11$$

### Homework

#### Simplify.

- 7)  $\sqrt{150}$
- 8)  $\frac{6}{5\sqrt{3}}$
- 9)  $\frac{3\sqrt{6}}{4\sqrt{15}}$
- 10)  $(4 + \sqrt{2})^2$
- 11)  $(4\sqrt{2})^2$
- 12)  $(4 + \sqrt{2})(4 - \sqrt{2})$
- 13)  $(1 - 2\sqrt{3})^2$

$$14) \frac{3}{2 - \sqrt{3}}$$

$$15) \frac{6}{5 - \sqrt{7}}$$

$$16) \frac{6 - \sqrt{6}}{6 - \sqrt{2}}$$

$$17) \frac{x}{x+3} - \frac{4}{x-3}$$

$$18) \frac{x}{3-x} + \frac{3}{x-3}$$

$$19) \frac{3}{4x+6} - \frac{x+4}{6x+9}$$

$$20) \frac{8x^3y^4 - 6x^4y^2 + 2x^2y^2}{2x^2y^2}$$

$$21) \frac{\frac{3x^3}{x^2-4}}{\frac{6x^2-9x}{2x^2+x-6}}$$

$$22) \frac{1}{1 - \frac{1}{1 - \frac{1}{x}}}$$

#### **Solve.**

$$23) \frac{6x}{x+15} = \frac{1}{4-x}$$

$$24) \frac{x+1}{2x-2} = \frac{x}{6} + \frac{1}{x-1}$$

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

## Problem Set #7

### Group Work

#### Long Division

Study the example below. It shows that  $(x^3+5x^2+11x+10) \div (x+2)$  equals  $x^2+3x+5$ .

$$\begin{array}{r} x^2+3x+5 \\ x+2 \overline{) x^3+5x^2+11x+10} \\ \underline{-(x^3+2x^2)} \phantom{+10} \\ 3x^2+11x \phantom{+10} \\ \underline{-(3x^2+6x)} \phantom{+10} \\ 5x+10 \phantom{+10} \\ \underline{-(5x+10)} \\ 0 \end{array}$$

Now try this one:

$$1) \frac{x^3+6x^2+15x+28}{x+4}$$

### Homework

#### Simplify.

$$2) \sqrt{280}$$

$$3) \sqrt{3^5}$$

$$4) 3\sqrt{2} + 4\sqrt{5}$$

$$5) (3\sqrt{2})(4\sqrt{5})$$

$$6) \frac{9}{5\sqrt{7}}$$

$$7) \frac{2x^2}{8x^6}$$

$$8) \sqrt{3} \cdot \frac{\sqrt{3}}{3}$$

$$9) (2 - \sqrt{5})^2$$

$$10) (3 + 2\sqrt{5})^2$$

$$11) (4 - 2\sqrt{3})(4 + 2\sqrt{3})$$

$$12) \frac{9}{5 + \sqrt{7}}$$

$$13) \frac{2 + \sqrt{3}}{2 - \sqrt{3}}$$

$$14) \frac{3x}{x+7} + \frac{3}{x-4}$$

$$15) \frac{7}{x+3} - \frac{4}{3+x}$$

$$16) \frac{7}{x-3} - \frac{4}{3-x}$$

$$17) \frac{7}{x-3} - \frac{4}{x+3}$$

$$18) \frac{x-2}{x^2-25} - \frac{2}{3x^2+15x}$$

$$19) \frac{\frac{x}{y} - \frac{x-y}{x+y}}{\frac{y}{x} + \frac{x-y}{x+y}}$$

$$20) \frac{\frac{4x^2-16}{15x^2-30x+15}}{\frac{12-6x}{25x^2-25}}$$

$$20) \frac{\frac{4x^2-16}{15x^2-30x+15}}{\frac{12-6x}{25x^2-25}}$$

#### Divide.

$$21) \frac{x^3+9x^2+23x+15}{x+3}$$

#### Solve.

$$22) \frac{3x+5}{6} - \frac{5}{x} = \frac{x}{2}$$

$$23) \frac{2}{x-1} = \frac{3}{x-2} + \frac{2}{x-4}$$

$$24) \frac{3x-1}{x} + \frac{3}{x-3} = \frac{9}{x^2-3x}$$

25) Janet earns \$22/hr as a computer programmer and \$16 per hour as a lab assistant. Last week, she worked twice as many hours in the lab as she did programming. How much time did she work in the lab if she made a total of \$648 between the two jobs?

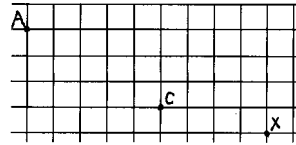
## Problem Set #6

### Section A

- 1) How many positive odd integers less than 10,000 can be written using only the digits 3,4,7,8, and 0 (and allowing for repeat digits)?
- 2) How many different ways are there to rearrange the letters of “STATISTICS”?
- 3) On a restaurant’s menu there are 8 main courses, and 5 desserts. How many ways are there...
  - a) to order a main course and a dessert?
  - b) to order three different main courses to be shared between friends?
- 4) A baseball team has 15 players, four of whom pitch. How many ways can the awards best pitcher, most valuable player, and most improved player be given if...
  - a) any player can receive more than one award?
  - b) any player can only receive at most one award?
- 5) Six numbers are drawn from a hat. What is the probability that the numbers will be drawn in either ascending or descending order?
- 6) Two cards are drawn from a 52-card deck. Find the probability that...
  - a) both are hearts.
  - b) neither is red.

### Section B

- 7) A pizza parlor has 12 different possible toppings that could be put on your pizza. How many possible ways could you choose 3 toppings or fewer?
- 8) In how many ways can 9 (different) presents be distributed to 3 children if each is to receive 3 presents?
- 9) Consider the map shown here:



- a) How many different shortest routes (no backtracking, no cutting across blocks) are there from A to C?
  - b) How many different shortest routes are there from A to X?
- 10) Four cards are drawn from a 52-card deck. Find the probability that you will pick a 6, 7, 8, and 9?
  - 11) With a five-card poker hand, what is the probability of getting...
    - a) no clubs.
    - b) all cards from the same suit.
    - c) only 5's and 6's.