

Middle School Math Prep

Day 1. 6/28 Monday

**Reviewing PSAT 8/9
Ratios-word problems**

Homework: 2010 SOL 6, SOL 7

Name: _____

1. The ratio of boys to girls in the sixth grade is 2 : 3.
 - a. If there are 24 boys, how many girls are there?
 - b. If there are 80 students, how many are girls?
 - c. If there are 75 students, how many more girls are there than boys?

2. There are 65 children in the sixth grade. There are 15 more boys than girls.
 - a. How many girls are in the class?
 - b. What is the ratio of boys to girls?
 - c. If 5 more girls joined the class, what is the ratio of boys to girls now?

3. There were 35 children and 10 adults at a cookout.
 - a. What is the ratio of adults to children at the cookout?
 - b. What is the ratio of children to total people at the cookout?
 - c. Five more children came to the cookout. Now what is the ratio of children to total people?

4. The ratio of green M & M's to yellow is 2 : 5.

a. If there are only green and yellow M & M's in the bag, what is the smallest number of M & M's possible?

b. If there are 84 M & M's in the bag all together, how many are green?

c. If red M & M's were added to the bag in part b to get a total of 100, what is the ratio of green to yellow to red?

5. Brian, Tim and Kenny got paid a total of \$240 for mowing neighborhood lawns. They split the money in the ratio of 5: 9: 10.

a. How much less did Brian make than Tim?

b. Brian complained about making so much less. The boys decided to break up their pay in a ratio of 3: 4: 5 instead. How much more does Brian make than in part a?

6. The ratio of students who wear glasses to the total class is 2 : 5.

a. What is the ratio of students who wear glasses to those who don't?

b. If there are 15 students who don't wear glasses, how many students are in the class?

c. If 5 of the students who didn't wear glasses now do, what is the ratio of students who wear glasses to those who don't?

7. A rope that is 2 feet and 6 inches long is cut into 3 strips in a ratio of 2: 3: 5.
- How long is the longest piece?
 - How much longer is the longest piece than the shortest one?
 - What is the length of each piece if they are cut in a 1:2:3 ratio?

8. Morgan and Kira have a number of jelly beans in a ratio of 5 : 3. Kira and Mann have a number of jelly beans in a ratio of 6 : 1.

- What is the ratio of Morgan's jelly beans to Mann's?
- If Morgan and Kira have 64 jelly beans, how many does Kira have?
- How many does Mann have?

Day 2. 6/30 Wednesday

**Fractions, whole numbers,
algebraic expressions**

Homework: Finish pages 5-16 by 7/1

Numbers and Fractions- In Class Notes

Multiply the following fractions *cancelling* where you can:

$$16. \frac{3}{4} \times \frac{7}{9} \quad 17. \frac{3}{16} \times \frac{48}{6} \quad 18. \frac{7}{15} \times \frac{2}{3} \quad 19. \frac{3}{5} \times \frac{10}{9} \quad 20. 4 \times \frac{3}{4}$$

$$21. \frac{2}{3} \times 9 \quad 22. \frac{3}{5} \times \frac{25}{27} \quad 23. \frac{3}{4} \times \frac{4}{3} \quad 24. 7 \times \frac{1}{7} \quad 25. \frac{6}{7} \times \frac{14}{36}$$

$$26. \frac{3}{8} \times \frac{16}{9} \quad 27. \frac{15}{17} \times \frac{5}{9} \quad 28. \frac{2}{3} \times \frac{1}{7} \quad 29. \frac{8}{9} \times \frac{18}{16} \quad 30. \frac{7}{8} \times \frac{24}{49}$$

$$31. \frac{2}{7} \times \frac{3}{4} \quad 32. \frac{5}{7} \times \frac{14}{10} \quad 33. 1 \times \frac{7}{8} \quad 34. 2 \times \frac{1}{2} \quad 35. \frac{1}{3} \times 3$$

Divide (cancel where you can):

1. $\frac{3}{8} \div \frac{1}{4}$
2. $\frac{7}{16} \div \frac{7}{8}$
3. $\frac{1}{3} \div 3$
4. $\frac{6}{7} \div \frac{5}{2}$
5. $1 \div \frac{1}{2}$
6. $\frac{2}{3} \div \frac{3}{2}$
7. $\frac{5}{6} \div \frac{5}{6}$
8. $\frac{2}{5} \div \frac{4}{5}$
9. $\frac{7}{8} \div \frac{14}{24}$
10. $\frac{1}{2} \div 4$
11. $\frac{3}{5} \div \frac{3}{4}$
12. $\frac{1}{7} \div 14$
13. $\frac{1}{3} \div \frac{3}{5}$
14. $\frac{2}{3} \div \frac{16}{9}$
15. $\frac{1}{7} \div \frac{15}{49}$
16. $\frac{3}{4} \div \frac{4}{3}$
17. $\frac{3}{4} \div \frac{3}{5}$
18. $\frac{3}{4} \div \frac{4}{7}$
19. $\frac{3}{4} \div \frac{1}{4}$
20. $2 \div \frac{1}{2}$

Add (reduce answer where you can):

1. $\frac{2}{3} + \frac{1}{3}$

2. $\frac{1}{5} + \frac{3}{5}$

3. $\frac{1}{3} + \frac{1}{6}$

4. $\frac{1}{7} + \frac{3}{8}$

5. $\frac{2}{7} + \frac{3}{21}$

6. $\frac{7}{16} + \frac{3}{32}$

7. $\frac{5}{6} + \frac{6}{7}$

10. $\frac{1}{3} + \frac{1}{2} + 1$

11. $\frac{2}{3} + \frac{1}{6} + \frac{1}{9}$

12. $\frac{1}{7} + \frac{1}{3} + \frac{1}{6}$

13. $\frac{1}{7} + \frac{1}{9}$

14. $\frac{2}{5} + \frac{4}{9}$

15. $\frac{3}{5} + \frac{7}{10}$

16. $\frac{8}{9} + \frac{9}{8}$

18. $\frac{3}{4} + 1 + 2\frac{1}{4}$

19. $3\frac{1}{2} + 2\frac{1}{4} + \frac{1}{9}$

20. $\frac{2}{3} + \frac{4}{7} + \frac{3}{5} + \frac{2}{5}$

21. $\frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5}$

22. $\frac{7}{8} + \frac{8}{7} + \frac{9}{8}$

23. $\frac{1}{2} + \frac{1}{4} + \frac{1}{6}$

24. $1 + \frac{1}{4} + \frac{1}{8}$

Subtract (reduce answer where you can):

1. $\frac{5}{8} - \frac{3}{8}$
2. $\frac{4}{7} - \frac{2}{7}$
3. $\frac{5}{6} - \frac{1}{12}$
4. $\frac{3}{8} - \frac{1}{4}$
5. $\frac{1}{7} - \frac{1}{8}$
6. $\frac{3}{2} - \frac{2}{3}$
7. $\frac{3}{4} - \frac{4}{7}$

11. $\frac{2}{3} - \frac{3}{5}$
12. $\frac{15}{16} - \frac{1}{8}$
13. $\frac{1}{2} - \frac{1}{3}$
14. $\frac{7}{16} - \frac{3}{32}$
15. $\frac{3}{5} - \frac{2}{6}$
16. $\frac{1}{3} - \frac{1}{5}$
17. $\frac{3}{4} - \frac{7}{16}$

21. $\frac{16}{17} - \frac{1}{34}$
22. $\frac{5}{8} - \frac{3}{10}$
23. $\frac{7}{6} - \frac{6}{7}$
24. $1\frac{2}{3} - \frac{1}{3}$
25. $1\frac{2}{3} - 1\frac{1}{6}$
26. $\frac{2}{9} - \frac{1}{8}$
27. $\frac{1}{5} - \frac{1}{6}$

Simplify the following complex fractions:

$$1. \frac{\frac{1}{2}}{\frac{1}{6}}$$

$$2. \frac{\frac{3}{4}}{\frac{7}{8}}$$

$$3. \frac{\frac{2}{3}}{\frac{7}{8}}$$

$$4. \frac{\frac{7}{16}}{\frac{3}{8}}$$

$$5. \frac{\frac{1}{3}}{\frac{1}{4}}$$

$$6. \frac{\frac{2}{5}}{\frac{5}{6}}$$

$$7. \frac{\frac{2}{5}}{\frac{3}{10}}$$

$$8. \frac{\frac{1}{9}}{\frac{1}{18}}$$

$$9. \frac{\frac{3}{7}}{\frac{9}{21}}$$

$$10. \frac{\frac{3}{4}}{\frac{4}{3}}$$

Multiply (reduce answer where you can):

1. $2\frac{1}{2} \times \frac{1}{8}$

4. $3\frac{1}{3} \times 2$

2. $3\frac{1}{4} \times \frac{1}{9}$

5. $3\frac{1}{2} \times 4\frac{1}{8}$

3. $1\frac{1}{2} \times 2\frac{1}{2}$

Evaluate:

1. $y - (y - 1)$

2. $(x + 3y) - (x + 2y)$

3. $2x^2 - x^2$

4. $3x^2 - (2x^2 + y)$

5. $-2x^2 - (x^2 + 3x^2) - (-2x^2)$

6. $-(-x - 2y) - (y - 2x)$

7. $(x + 3y) + (x - 2y)$

8. $2x - y - (2x + y)$

9. $a^2 + 2ab + b^2 - (a^2 - 2ab + b^2)$

10. $a - b - (a + b)$

11. $x^2 - y^2 - (y^2 - x^2)$

12. $x^2 - 2x^2 + 3y^2 - 2y^2$

13. $y^2 - 3y^2 - 5y^2 + 2y^2$

14. $(y + 2y) - (y - 2y) + y$

15. $x^2 - y^2 + (x^2 + y^2) - (x^2 - y^2) + x^2$

Multiply:

1. $(3x)$ by $(2x^2)$

2. $(2x)$ $(7x^3)$

3. $(-2x)$ $(-3x)$

4. $2x$ $(2x + 1)$

5. $2x$ $(1 - 2x)$

6. $(x + 1)$ $(x - 1)$

7. $(x + 1)$ $(x + 2)$

8. $(x + 1)$ $(x - 2)$

9. $(2x + 2)$ $(x - 1)$

10. $(3y - 1)$ $(3y + 3)$

11. $(a + b)$ $(a - b)$

12. $(-2x)$ $(3x^2)$

13. $(2x - 1)$ $(2x + 1)$

14. $(-1 - y)$ $(-1 + y)$

15. $(y^2 - 1)$ $(y^2 - 1)$

16. $(x + 2)$ $(x^2 + 2)$

17. $(x - 3)$ $(x - 5)$

18. $(x + 3)$ $(x - 5)$

19. $(x + 3)$ $(x + 5)$

20. $(x - 3)$ $(x + 5)$

Add or Subtract:

$$1. \frac{3}{x} + \frac{4}{y}$$

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

$$3. \frac{2}{3x} + \frac{6}{2x}$$

$$4. \frac{2}{3x} - \frac{6}{2x}$$

$$5. \frac{a}{b} + \frac{c}{d}$$

$$6. \frac{2}{y} - \frac{1}{y}$$

Solve for x (in terms of y):

1. $3x - 2y = 2x$

2. $3x - 2y = 2x + y$

3. $2x + y = 6$

4. $y - x = 3y$

5. $y - x = 2y + x$

6. $\frac{x}{y} = 2$

7. $x - y = y - x$

8. $3x + 3y = 3$

9. $\frac{x+1}{y} = 2$

10. $3x + 4y = 4x + 3y$

Absolute Values- In Class Practice

1) $|3x| = 9$

2) $|-3r| = 9$

3) $\left|\frac{b}{5}\right| = 1$

4) $|-6m| = 30$

5) $\left|\frac{n}{3}\right| = 2$

6) $|-4 + 5x| = 16$

7) $|-2r - 1| = 11$

8) $|1 - 5a| = 29$

9) $|-2n + 6| = 6$

10) $|v + 8| - 5 = 2$

19) $3|3 - 5r| - 3 = 18$

20) $5|9 - 5n| - 7 = 38$

Submit the answers & show work to virginiasemeducation@gmail.com