Fractions Practice

Practice #1

Simplify the following fractions.

1. $\dfrac{6}{28}$ 2. $\dfrac{36}{104}$ 3. $\dfrac{924}{3192}$

Practice #2

Simplify the following fractions.

1. $\dfrac{9}{15}$ 2. $\dfrac{70}{52}$

Practice #3

For each group of fractions given below, place the fractions in order from smallest to largest.

A. $\dfrac{2}{3}, \dfrac{25}{28}$ B. $\dfrac{7}{10}, \dfrac{9}{14}, \dfrac{21}{28}$ C. $\dfrac{29}{85}, \dfrac{33}{105}, \dfrac{47}{150}$

Practice #4

For each group of fractions given below, place the fractions in order from smallest to largest.

A. $\frac{5}{8}, \frac{3}{4}$

B. $\frac{16}{20}, \frac{11}{15}, \frac{21}{25}$

Practice #5

1. Complete the multiplication for each of the following:

   a. $\frac{4}{5} \times \frac{15}{17}$

   b. $\frac{5}{14} \times \frac{3}{10} \times \frac{7}{12}$

2. Complete the division for each of the following:

   a. $\frac{5}{2} \div \frac{7}{12}$

   b. $\frac{20}{11} \div \frac{100}{99}$

3. Complete the addition for each of the following:

   a. $\frac{3}{8} + \frac{5}{2}$

   b. $\frac{13}{85} + \frac{12}{45}$

4. Complete the subtraction for each of the following:

   a. $\frac{13}{16} - \frac{2}{3}$

   b. $\frac{3}{8} - \frac{5}{2}$

Practice #6

1. Complete the multiplication for each of the following:

   a. $\frac{2}{9} \times \frac{3}{8}$

   b. $\frac{20}{6} \times \frac{15}{10}$

2. Complete the division for each of the following:

   a. $\frac{1}{4} \div \frac{7}{26}$

   b. $\frac{2}{7} \div \frac{5}{24}$

3. Complete the addition for each of the following:

   a. $\frac{7}{8} + \frac{1}{6}$

   b. $\frac{5}{2} + \frac{7}{12}$

4. Complete the subtraction for each of the following:

   a. $\frac{3}{2} - \frac{7}{12}$

   b. $\frac{5}{2} - \frac{1}{7}$

Percents Practice

Practice #1

1. Express the following decimals as percents.

    a.   .96   b.   .0036

2. Express each of the following fractions as percents.

    a.   69/100   b.   5/8

3. Express each of the following percents as both a fraction and a decimal.

    a.   58%   b.   135%

Practice #2

1. Express the following decimals as percents.

    a. .25   b. 1.25

2. Express each of the following fractions as percents.

    a. 75/100   b. 1/5

3. Express each of the following percents as both a fraction and a decimal.

    a. 30%   b. 80%

Practice #3

The population growth of Raleigh, North Carolina:
        Population in 1985 = 171,000
        Population in 1995 = 241,000
What is the percent change in population from 1985 to 1995?

Practice #4

The 1980 Census Report listed the population of Pullman as 17,316. The 1990 Census Report listed the population as 18,373. Find the percent change in the population. Round the percent to the nearest tenth.

Practice #5

Last year, the owner of Sammy's Woodfired Pizza Restaurant spent $420 a month on energy costs. This year, the owner struck a deal with a local fuel company. His energy cost per month is now $375. Find the percent change in energy costs.

Practice #6

What is 45% of 300?

60 is what % of 240?

30 is 15% of what number?

Ratios Practice

Practice #1

You go to the store to purchase some food. You are not sure if you want chicken or ground beef. You decide that you will buy whichever will give you the most food for your money. The package of boneless chicken costs $3.15 for 1.5 pounds. Ground beef costs $5.48 for 2 pounds. Which of these two would be a better buy, in terms of pounds of food per dollar?

Practice #2

A large university employs 275 work-study students. The 150 men that are employed together take home a total of $6,000 per week, and the 125 women together earn $5,625 per week. Who, on average, makes more, a man or a woman?

Proportions Practice

Practice #1

1. If you can travel an average of 15 miles per hour on a bicycle, how long will it take you to travel 50 miles?
2. 2,500 flights took off from Boston's Logan International Airport in the last two days. At that rate, how many will take off in the next week (7 days)?
3. If Japan and the United States combined to spend approximately 65% of the world's private expenditures (which totaled 3.2 trillion dollars), how much did they spend? Keep your answer in trillions of dollars, rounded to the hundredths place.

Practice #2

1. In a major city, 8% of the potential work force (which consists of 550,000 people) are unemployed. How many people are unemployed?
2. Of the 112 small businesses in the local industrial park, 18 have declared bankruptcy within the last five years. What percent of the businesses is this? Round to the nearest tenth.
3. If eleven students dropped out of a high school within the last three years, how many will drop out in the next five? Assume the drop out rate will not change. Round to the nearest whole number.

Graphing Practice

Practice #1

Use the graph below to answer the three questions for this problem.
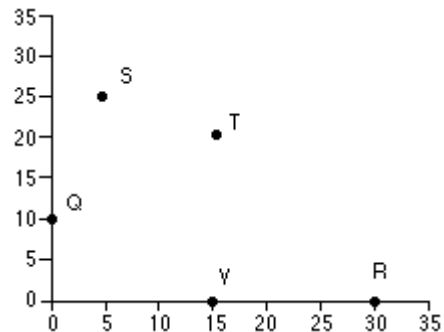
1. Which point is (0, 6)?
2. What is the *y*-coordinate of point S?
3. What are the coordinates of point T?
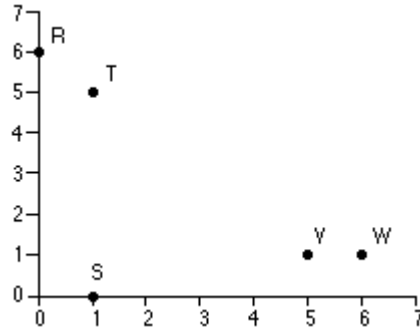
Practice #2

Use the graph below to answer the four questions for this problem.

1. Which point(s) lie on the *x*-axis?
2. What is the *y*-coordinate of point S?
3. What are the coordinates of point Q?
4. What are the coordinates of point T?

Practice #3

Graph the equation: $y = 2x + 2$

Practice #4

Graph the equation: $y = 2x + 10$

Practice #5

Complete the three questions for this practice.

1. What is the slope of the line connecting the points (0, 3) and (8, 5)?

2. Calculate the slope of the line given in the figure below.
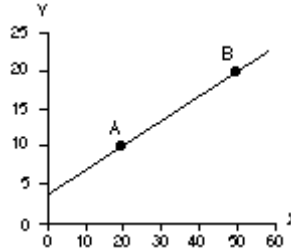
3. In the figure below, which line (A, B, or C) has the slope with the largest value? Which one has the slope with the smallest value?
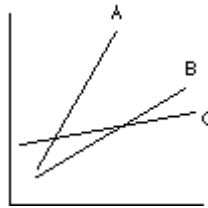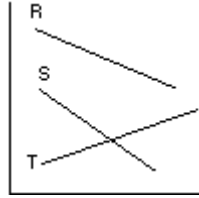

Practice #6

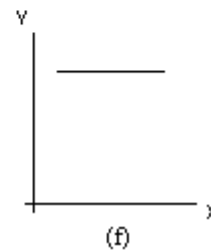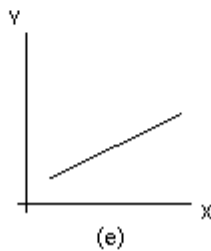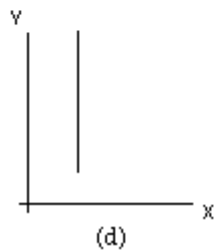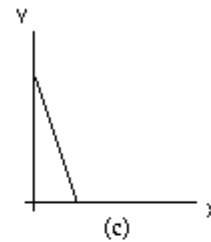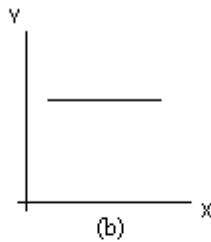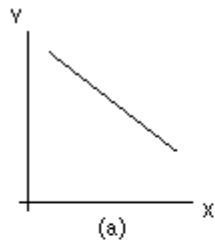Calculate the slope of the line given in the figure below.
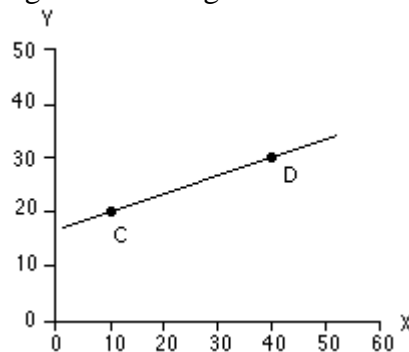
Practice #7

1. In the figure below, which line(s) (R, S, or T) have a positive slope? Which one(s) have a negative slope?

2. In the graphs below (a through f), which contain(s) a line with a positive slope? A negative slope? Slope of zero? Infinite slope?

Practice # 8

What are the slopes and *y*-intercepts of the following equations?

1. $y = 2/3\ x + 6$
2. $y = 25 + 10\ x$
3. $y = 2 - 5\ x$
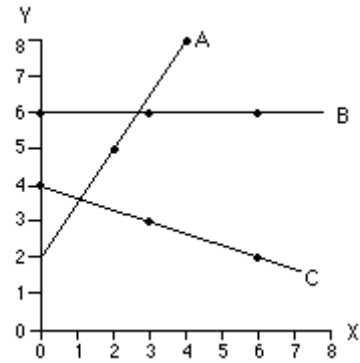4. $y = 3\ x$

Practice # 9

What are the slopes and *y*-intercepts of the following equations?

1. $y = 5\ x + 1$
2. $y = x$
3. $y = 21 - 3\ x$
4. $y = -30\ x + 2$

Practice #10

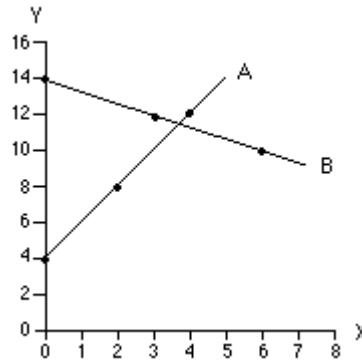Match each line in the graph with its equation.

1. $y = 4 + (1/3) x$
2. $y = 6$
3. $y = -1/3 + 4 x$
4. $y = x + 6$
5. $y = 4 - (1/3) x$
6. $y = (3/2)x + 2$
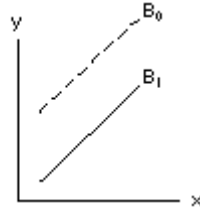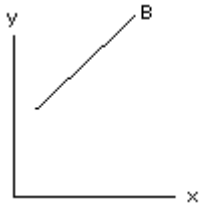

Practice #11

Match each line in the graph with its equation.

1. $y = 4 - 2 x$
2. $y = (2/3)x + 14$
3. $y = 1/2 x + 4$
4. $y = 4 + 2 x$
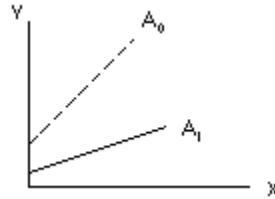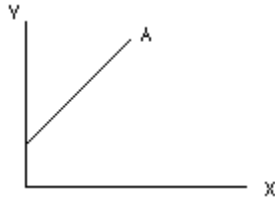5. $y = 14 - (3/2) x$
6. $y = 14 - (2/3) x$

Practice #12

1. In the graph below, the straight line B is given by the equation $y = Tx + P$. If the line shifts from this initial position B_0 to a new position of B_1, what must have changed in the equation?

2. In the graph below, the line A is given by the equation $y = Z + Wx$. If the line shifts from this initial position A_0 to a new position of A_1, what must have changed in the equation?

Practice #13

In the graph below, the straight line S is given by the equation $y = c + dx$. If the line shifts from this initial position S_0 to a new position of S_1, what must have changed in the equation?
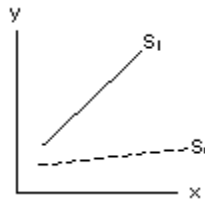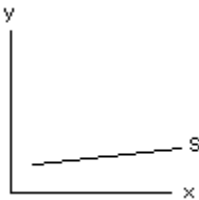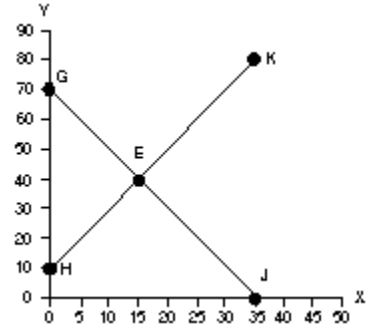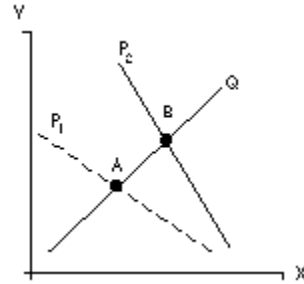
Practice #14

1. Using the graph below, answer the following questions.

    1. At what coordinates does the line GJ intersect the *y*-axis?

    2. What are the coordinates of the intersection of lines GJ and HK?
    3. At a *y* value of 60, what is the x value for line GJ?
    4. At point K, what is the *y*-coordinate?

2. The graph on the lower left has two intersecting lines, Q and P. Line P shifts to the right (shifts from P₁ to P₂) as well as changing slope. This shift is illustrated on the graph given at the lower right.

    How is the point of intersection affected by this shift (how do the coordinates of the intersection change)?

Practice #15
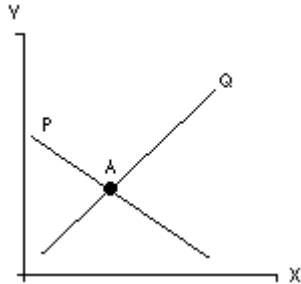
1. Using the graph below, answer the following questions.

1. At what coordinates does the line AC intersect the *y*-axis?
2. At a *y* value of 200, what is the x value for line AC?
3. What are the coordinates of the intersection of lines AC and RS?

2. The graph below has two intersecting lines, R and S.

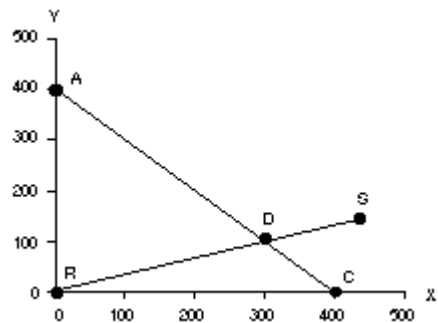Line S shifts to the left (shifts from S_1 to S_2). This shift is illustrated on the graph below. How is the point of intersection affected by this shift (how do the coordinates of the intersection change)?
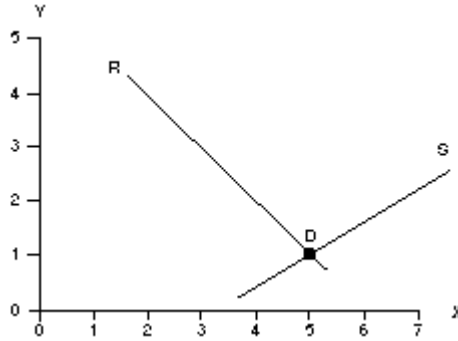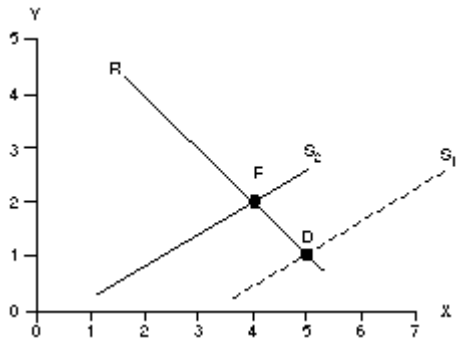

Practice #16

Using the figure below, find the slope of the following curve at point B.
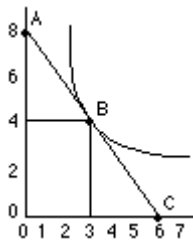
Algebra: Operations Practice

Practice #1

$3 + 2 \cdot 8 - 4$

Practice #2

$(9 \cdot 3) + (5 - 2)^3$

Practice #3

$(5 + 7)^2 \cdot 4 \div 2 - 88$

Practice #4

$\{4 \, [2 \, (2 + 2)^3 \div 2]\} \div 2$

Practice #5

$3b^2 + 5b^2 \div 2b \cdot 8b - 4b$

Practice #6

$(5rs + 7r) \cdot r(4 \div 2)^3$

Practice #7

$(9 \cdot x) \div (5x - 2y)x$

Practice #8

$\{2 \, [15kz + (32k^2 \div 4k)^2] - 30kz\} \div 8$

Algebra: Solving Equations Practice

Practice #1

For each equation given, solve for the requested variable.

1. $10 - 7 = x - 1$ Solve this equation for x.
2. $2z - 4 = 36 - 3z$ Solve this equation for z.
3. $4(x + 3) = 25 + 2 + x$ Solve this equation for x.
4. $\dfrac{4q + 5}{4} = 2(3q + 5)$ Solve this equation for q.

Practice #2

For each equation given, solve for the requested variable.

1. $9 = q - 5$ Solve this equation for q.
2. $3x + 5 = 25 - x$ Solve this equation for x.
3. $2(c + 4) = 3(2c - 13)$ Solve this equation for c.

Practice #3

For each equation given, solve for the requested variable.

1. $2a + 4b = 12$ Solve this equation for a.
2. $6x^2y = z + 7x^2y$ Solve this equation for y.
3. $3cz + c = 9cz + 5$ Solve this equation for c.

Practice #4

For each equation given, solve for the requested variable.

1. $3xy + 3z = 3$ Solve this equation for z.
2. $11ab - 3b = 2ab$ Solve this equation for a.
3. $10kpq - q = 2kp + 3q$ Solve this equation for q.

Practice #5

Below are two practice problems. Solve one problem using the substitution method and the other problem using the addition/subtraction method.

Q1. Salesmen at Northern Castings pay for supplies under one of two payment plans.

Payment Plan Option I: $300 base salary per month and 6% commission on sales made. If x is the amount of sales, the amount of monthly pay earned, y, is given by the equation $y_I = 300 + 0.06x$.

Payment Plan Option II: Base pay of $150 and 10% commission on sales made. If x is the amount of sales, the amount of monthly pay earned, y, is given by the equation $y_{II} = 150 + 0.10x$.

At what value of their sales, x, will the income for both options be the same, $y_I = y_{II} = y$? The two equations are:

$$y = 300 + 0.06x$$

$$y = 150 + 0.10x$$

Q2. The Great American Treehouse is a place that holds parties. The base cost for a party is $69.96 for up to 15 people, then $3 for each additional person over 15 people. For parties over 15 people, the cost of a party (in dollars) at The Great American Treehouse is given by the following equation, where y is the total cost, and x is the number of people attending the party.

$$y = 69.96 + 3 (x - 15)$$

If you wish to purchase ice cream for the party from Chunk's Ice Cream Parlor, you can purchase unlimited amounts of ice cream at a cost of $3.96 per person. The cost of ice cream is given by the following equation, where y is the total cost and x is the number of persons.

$$y = 3.96x$$

Solve this system of equations. Find both the cost and number of people for whom the cost of ice cream will be equal to the cost of using The Great American Treehouse.

Practice #6

John leaves his house and drives west at 40mph. Sam lives 25 miles west of John and leaves his house at the same time as John. Sam is traveling 30mph. John catches up with Sam after John has driven D miles. The distance driven by John is given by $40t = D$. The distance Sam drives, $D - 25$, is given by $30t = D - 25$, where t is the amount of time they drive. Find out how long they drove and the distance John traveled.

Practice #7

Enola has time to read about 50 pages of a novel a day. Write an expression for the approximate number of days it will take her to read a novel that is p pages long. How long will it take Enola to read the 1083-page novel *Chesapeake* by James Michener?

Practice #8

Copies cost $0.05 each, and there is a service fee of $1.00. Write an equation for this relationship, and be sure to define your variables. Which variable is dependent upon the other?

Practice #9

In your Intro to Policy class, there are half as many men as there are women. Write an equation for this relationship, and be sure to define your variables.

Practice #10

When Bryant leaves town, he has to take his cat Smokey to a kennel. The cost of the kennel is $7 per day. He always has them give Smokey one flea bath that costs $18.
   a) Write an equation that represents the relationship.
   b) When Bryant left Smokey at the kennel in July, the total cost was $46. Write an equation that can be solved to find how many days the cat stayed at the kennel, and solve.