

1. Find the product and write it in lowest terms. $\frac{16}{39} \cdot \frac{3}{10} = \square$

$$\frac{16}{39} \cdot \frac{3}{10}$$

2. Find the quotient and write it in lowest terms. $\frac{35}{3} \div \frac{7}{15} = \square$

$$\frac{35}{3} \div \frac{7}{15}$$

(Simplify your answer. Type an integer or a fraction.)

3. Divide and simplify. $\frac{7}{4} \div \frac{14}{3} = \square$

$$\frac{7}{4} \div \frac{14}{3} = ?$$

(Simplify your answer. Type a fraction.)

4. Write the rational expression in lowest terms.

$$\frac{(v+1)(v+4)}{(v+3)(v-1)} \cdot \frac{(v+3)(v+6)}{(v+1)(v+4)}$$

$$\frac{(v+1)(v+4)}{(v+3)(v-1)} \cdot \frac{(v+3)(v+6)}{(v+1)(v+4)} = \square$$

5. Multiply.

$$\frac{7x-14}{5x+10} \cdot \frac{14x+28}{10x-20}$$

$$\frac{7x-14}{5x+10} \cdot \frac{14x+28}{10x-20} = \square \text{ (Type an integer or a fraction. Simplify your answer.)}$$

6. Multiply the expressions.

$$\frac{x^2-8x+15}{x^2-3x-10} \cdot \frac{x^2-4}{x^2-9}$$

$$\frac{x^2-8x+15}{x^2-3x-10} \cdot \frac{x^2-4}{x^2-9} = \square$$

(Simplify your answer. Leave the result in factored form.)

HW 3

7.

Perform the indicated operations.

$$\frac{35x}{x-1} + \frac{70}{x^2-1} - \frac{35x}{x+1}$$

$$\frac{35x}{x-1} + \frac{70}{x^2-1} - \frac{35x}{x+1} = \square$$

(Simplify your answer. Type your answer in factored form.)

8.

Add. Simplify, if possible.

$$\frac{5}{y+4} + \frac{9}{7y} + \frac{20}{y^2+4y}$$

The sum is $\square$. (Simplify your answer.)

9.

Add. Simplify, if possible.

$$\frac{3}{z+4} + \frac{9}{5z} + \frac{12}{z^2+4z}$$

The sum is $\square$. (Simplify your answer.)

10.

Add or subtract as indicated.

$$\frac{5x}{x+2} + \frac{18}{x-2} - \frac{40}{x^2-4}$$

$$\frac{5x}{x+2} + \frac{18}{x-2} - \frac{40}{x^2-4} = \square \text{ (Simplify your answer.)}$$

11.

Add or subtract as indicated. Write your answer in lowest terms.

$$\frac{6}{x+2} + \frac{19}{x^2-2x+4} - \frac{72}{x^3+8}$$

Which of the following is the answer in lowest terms?

☐ A. $\frac{6x+2}{x^2-2x+4}$

☐ B. $\frac{6x^2+7x-10}{x^3+8}$

☐ C. $\frac{6x-5}{x^2-2x+4}$

☐ D. $\frac{6x-5}{x^3+8}$

12. Perform the indicated operation and simplify, if possible.

$$\frac{7}{z+3} + \frac{-8z-3}{z^2+3z} - \frac{6-z}{z}$$

$$\frac{7}{z+3} + \frac{-8z-3}{z^2+3z} - \frac{6-z}{z} = \boxed{}$$

13. Simplify.

$$\frac{\frac{4}{3} + \frac{7}{6}}{\frac{1}{11} - \frac{9}{22}}$$

The simplified expression is $\boxed{}$.
(Type an integer or a simplified fraction.)

14. Simplify.

$$\frac{4 + \frac{2}{3}}{3 - \frac{2}{5}}$$

The quotient is $\boxed{}$.

15. Use any method to simplify the complex fraction.

$$\frac{\frac{20}{x-2}}{\frac{16}{x}}$$

$$\frac{\frac{20}{x-2}}{\frac{16}{x}} = \boxed{}$$

16.

Simplify.

$$\frac{\frac{\frac{1}{d} + \frac{1}{b}}{\frac{1}{d^2} - \frac{1}{b^2}}}{\frac{1}{d} + \frac{1}{b}} = \boxed{} \text{ (Simplify your answer.)}$$

17.

Use any method to simplify the complex fraction.

The fraction simplifies to $\boxed{}$.

$$\frac{y - \frac{3y - 8}{8}}{\frac{15}{40} + \frac{3}{5y}}$$

18.

Simplify.

$$\frac{\frac{w}{w+9} + \frac{9}{3w}}{\frac{w}{8w+72} + \frac{2}{w}}$$

The simplified expression is $\boxed{}$.

19.

Solve the equation.

$$\frac{-3}{2x} - \frac{23}{14x} = \frac{-11}{14}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

☐ A. The solution set is $\{\boxed{}\}$.

(Type an integer or a fraction. Use a comma to separate answers as needed.)

☐ B. The solution set is $\emptyset$.

20. Solve.

$$p + \frac{8}{p} = -9$$

Select the correct choice below and fill in any answer boxes present in your choice.

- ☐ A. The solution set is $\{\square\}$.
(Type an integer or a fraction. Use a comma to separate answers as needed.)
- ☐ B. There is no solution.

21. Solve.

$$\frac{x}{6} - \frac{91}{6x} = -1$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The solution set is $\{\square\}$.
(Type an integer or a fraction. Use a comma to separate answers as needed.)
- ☐ B. There is no solution.

22. Solve.

$$\frac{1}{t+2} + \frac{5}{t+8} = \frac{6}{t^2 + 10t + 16}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The solution set is $\{\square\}$.
(Type an integer or a fraction. Use a comma to separate answers as needed.)
- ☐ B. There is no solution.

23.

Solve the equation.

$$\frac{5}{4x+3} + \frac{1}{x} = \frac{2}{x}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

☐ A. The solution set is $\{\square\}$.

(Type an integer or a fraction. Use a comma to separate answers as needed.)

☐ B. The solution set is $\emptyset$.

24.

Solve.

$$\frac{1}{x+4} + \frac{9}{x+5} = \frac{1}{x^2+9x+20}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

☐ A. The solution set is $\{\square\}$.

(Type an integer or a fraction. Use a comma to separate answers as needed.)

☐ B. There is no solution.

25.

Solve.

$$\frac{x}{x-5} + \frac{1}{x+5} = \frac{50}{x^2-25}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

☐ A. The solution set is $\{\square\}$.

(Type an integer or a fraction. Use a comma to separate answers as needed.)

☐ B. The solution is the empty set.

26.

Solve.

$$\frac{x}{x-2} + \frac{5}{x+2} = \frac{8}{x^2-4}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

☐ A. The solution set is $\{\square\}$.

(Type an integer or a fraction. Use a comma to separate answers as needed.)

☐ B. The solution is the empty set.

27.

Solve the equation.

$$\frac{4}{w^2+2w-24} + \frac{5}{w^2+w-20} = \frac{1}{w^2+11w+30}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

☐ A. The solution set is $\{\square\}$.

(Type an integer or a fraction. Use a comma to separate answers as needed.)

☐ B. The solution set is $\emptyset$.

28.

Solve the equation for b.

$$\frac{ca}{b} = \frac{fd}{e}$$

$$b = \square$$

29.

Solve $h = \frac{nd}{d+nt}$ for d.

Choose the correct expression for d.

☐ A. The solution is $d = \frac{hnd}{n-h}$.

☐ B. The solution is $d = \frac{hnt}{n+h}$.

☐ C. The solution is $d = \frac{hnt}{h-n}$.

☐ D. The solution is $d = \frac{hnt}{n-h}$.

30. Solve the following problem for the specified variable.

$$B = \frac{1}{4}h(r+k) \text{ for } r$$

$$r = \boxed{}$$

31. In a recent year, a single person could expect to pay \$6800 in income taxes on an adjusted gross income of \$34,000. How much more tax should the person expect to pay if her adjusted gross income increased by \$5000, knowing that this would not move her into the higher tax bracket?

She should expect to pay \$ more in taxes.

32. Triangle ABC is similar to triangle DEF. The following ratios of corresponding sides are equal.

$$\frac{4}{6} = \frac{12}{18} = \frac{4x+1}{4x+7}$$

$$x = \boxed{}$$

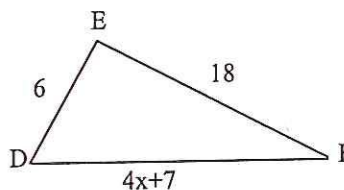
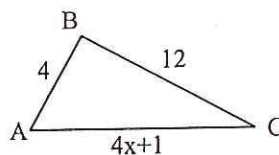
(Type a simplified fraction.)

$$\text{Side AC} = \boxed{}.$$

(Type an integer or decimal rounded to the nearest tenth.)

$$\text{Side DF} = \boxed{}.$$

(Type an integer or decimal rounded to the nearest tenth.)



33. Nurses use proportions to determine the amount of drug to administer when the dose of the drug is measured in mg, but the drug is packaged in a diluted form in mL. For example, to find the number of milliliters of fluid needed to administer 300 mg of a drug that comes packaged as 120 mg in 2 mL of fluid, a nurse sets up the proportion $\frac{120 \text{ mg}}{2 \text{ mL}} = \frac{300 \text{ mg}}{x \text{ mL}}$ where x represents the amount to administer in milliliters. Use this method to find the correct dose for 175 mg of a drug packaged as 140 mg in 2-mL vials.

$$x = \boxed{} \text{ mL (Simplify your answer.)}$$

34. If Dr. Suzuki rides his bike to his office, he averages 15 miles per hour. If he drives his car, he averages 30 miles per hour. His time driving is $\frac{1}{5}$ hour less than his time bicycling. How far is his office?

His office is miles away.

(Type an integer or a decimal.)

35. A private plane traveled from Seattle to a rugged wilderness, at an average speed of 462 mph. On the return trip, the average speed was 264 mph. If the total traveling time was 8 hours, how far is Seattle from the wilderness?

Seattle is miles from the wilderness.

36. A jet flew at an average speed of 480 mph from Point X to Point Y. Because of head winds, the jet averaged only 440 mph on the return trip, and the return trip took 45 minutes longer. How many hours was the flight from Point Y to Point X? How far is it from Point X to Point Y?

How many hours was the flight from Point Y to Point X?

How far (in miles) is it from Point X to Point Y?

37. The weight M of an object on the moon varies directly as its weight E on earth. A person who weighs 163.06 lb on earth weighs 27.72 lb on the moon. How much would a 238.24-lb person weigh on the moon?

A 238.24-lb person would weigh lb on the moon. (Round to the nearest tenth.)

38. Solve the problem.

The weight W of an aluminum flatboat varies directly with the length L of the boat. If a 10-foot boat weighs 170 pounds, then what is the weight of a 7-foot boat?

The weight of a 7-foot boat is pounds.

39. Pairs of markings, a set distance apart, are made on highways so that police can detect drivers exceeding the speed limit. Over a fixed distance, the speed R varies inversely with the time T . For one particular pair of markings, R is 90 mph when T is 5 seconds. Find the speed of a car that travels the given distance in 9 seconds.

$R =$ mph

(Round to the nearest whole number.)

40. The distance d that an object falls is directly proportional to the square of the time of the fall, t . A person who is parachuting for the first time is told to wait 12 seconds before opening the parachute. If the person falls 64 feet in 2 seconds, find how far he falls in 12 seconds.
- The distance is feet.
-
41. Electrical current. The current I in an electrical conductor varies inversely as the resistance R of the conductor. The current is $\frac{1}{7}$ ampere when the resistance is 33614 ohms. What is the current when the resistance is 2744 ohms?
- The current is ampere.
(Simplify your answer.)
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42. The intensity I of light from a light bulb, measured in watts per square meter (w/m^2), varies inversely as the square of the distance d from the light bulb. Suppose I is 85 w/m^2 when the distance is 4 m. Find the intensity when the distance from the light bulb is 3 m away.
- $I = \text{} \text{ w/m}^2$
(Simplify your answer. Type an integer, fraction, or mixed number.)
-
43. For a given interest rate, simple interest varies jointly as the principal and time. If \$1000 left in an account for 4 years earned interest of \$200, then how much interest would be earned in 7 years?
- The amount of interest earned in 7 years would be \$.
-
44. The weight of a fish varies jointly as its girth and the square of its length. One fish weighed in at 23.7 lb and measured 36 in long with 25 in girth. How much would a fish 41 in long with 26 in girth weigh?
- The fish would weigh approximately lb.
(Round to the nearest tenth as needed.)
-
45. The force needed to keep a car from skidding on a curve varies inversely as the radius of the curve and jointly as the weight of the car and the square of the speed. If 168 lb of force keeps a 2000-lb car from skidding on a curve of radius 500 ft at 25 mph, what force would keep the same car from skidding on a curve of radius 850 ft at 40 mph?
- The force is lb.
(Do not round until the final answer. Then round to the nearest integer as needed.)
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