SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Provide an appropriate response.

1) The ratio of gorillas to chimpanzees in a zoo is 6 : 3. (i) What is the ratio of chimpanzees to gorillas? (ii) Apes to gorillas? (iii) Chimpanzees to apes?

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Solve the problem.

2) Complete the table so that the ratios \( \frac{x}{y} \) will all be equivalent to \( \frac{3}{8} \) (some values may not be whole numbers). Express your answers as integers or decimals rounded to one decimal place.

<table>
<thead>
<tr>
<th>x</th>
<th>3</th>
<th>?</th>
<th>15</th>
<th>1.5</th>
<th>?</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>?</td>
<td>24</td>
<td>28</td>
<td>?</td>
<td>36</td>
</tr>
</tbody>
</table>

A) \[
\begin{array}{l}
\text{x} & 3 & 27 & 10.5 & 15 & 1.5 & 28.5 \\
\text{y} & 24 & 24 & 28 & 120 & 4 & 36 \\
\end{array}
\]

B) \[
\begin{array}{l}
\text{x} & 3 & 9 & 10.5 & 15 & 1.5 & 13.5 \\
\text{y} & 8 & 24 & 28 & 40 & 4 & 36 \\
\end{array}
\]

C) \[
\begin{array}{l}
\text{x} & 3 & 18 & 21 & 15 & 1.5 & 27 \\
\text{y} & 18 & 24 & 28 & 80 & 8 & 36 \\
\end{array}
\]

D) \[
\begin{array}{l}
\text{x} & 3 & 6 & 10.5 & 15 & 1.5 & 7.5 \\
\text{y} & 8 & 24 & 28 & 32 & 4 & 36 \\
\end{array}
\]

Express the ratio in simplest form.

3) 14 minutes to 5 hours
A) 14 : 5       B) 168       C) 14 : 60       D) 7 : 150

4) 7 feet to 80 inches
A) 21 : 20      B) 7 : 80     C) 7 : 960      D) 80 : 7

5) The ratio of all members to women members in a club whose members are 14 men and 26 women
A) 20 : 7       B) 13 : 7     C) 7 : 13       D) 20 : 13

6) 120 cm to 45 cm
A) 8 : 3       B) 9 : 4     C) 3 : 8       D) 4 : 9
Provide an appropriate response.

7) Express $7 : \frac{1}{6}$ as a ratio whose terms are whole numbers.
   A) 3 : 7  B) 1 : 14  C) 6 : 14  D) 14 : 1

8) Express 78 : 7.8 as a ratio whose second term is 1.
   A) 0.78 : 1  B) 780 : 1  C) 100 : 1  D) 10 : 1

Solve the problem.

9) Find the best buy.
   Brand X 8 oz for $2.96
   Brand Y 10 oz for $3.80
   A) Brand Y  B) Equal value  C) Brand X  D) Not enough information

10) Find the best buy.
    Brand X 16 oz for $6.08
    Brand Y 12 oz for $4.32
    A) Equal value  B) Brand Y  C) Brand X  D) Not enough information

11) The ratio of staff to patients at Lakeview is 8 to 7. If total staff plus patients is 1575 people, how many staff are at Lakeview?
    A) 630  B) 735  C) 840  D) 945

12) The fuel for a gas snowblower consists of 1.7 parts oil to 30.6 parts gas. Determine the ratio of oil to gas in simplest form.
    A) 1 : 18  B) 17 : 1  C) 18 : 1  D) 1 : 19

13) A recipe for muffin mix calls for 8 cups of flour, $\frac{2}{3}$ cups of oatmeal, and 4 tablespoons of baking powder along with other ingredients. If you had only 3 cups of flour, what would be the comparable amounts of oatmeal and baking powder.
    A) $\frac{3}{5}$ cups of oatmeal, $\frac{3}{4}$ tablespoons baking powder
    B) 3 cups of oatmeal, $4\frac{1}{2}$ tablespoons baking powder
    C) 2 cups of oatmeal, 3 tablespoons baking powder
    D) 1 cup of oatmeal, $1\frac{1}{2}$ tablespoons baking powder

14) The trim for a costume costs $38.25 for 4.5 yd. Find the unit price in dollars per yard.
    A) $8.50 per yd  B) $42.75 per yd  C) $76.50 per yd  D) $33.75 per yd

15) An 8-oz bottle of hair spray costs $3.66. Find the unit price in cents per ounce.
    A) 29.28 cents per oz  B) 45.75 cents per oz
    C) 0.4575 cents per oz  D) 36.6 cents per oz
SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.
Provide an appropriate response.

16) Can you set up a proportion to solve this problem? Alice is 10 years old. Her hair is 10 inches long. How long will her hair be when she is 20 years old?

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.
The two triangles below are similar. Find the missing lengths.

17) 

![Triangle Diagram]

A) x = 20  
B) x = 5  
C) x = 15  
D) x = 16

18) 

![Triangle Diagram]

A) x = 7.2; y = 3.9  
B) x = 6.3; y = 3.9  
C) x = 1.24; y = 3.6  
D) x = 6.3; y = 3.6

Use a proportion to solve the problem. Round answers to the nearest tenth if necessary.

19) Joan can mow a 10- acre field in 5 hours. How long would it take her to mow a 3.8- acre field?

A) 1.9 hr  
B) 0.4 hr  
C) 3.9 hr  
D) 4.9 hr

20) On a map of the Thunderbird Country Club golf course, 2.5 inches equals 45 yards. How long is the 8th hole if the map shows 10.5 inches?

A) 189 yd  
B) 10.7 yd  
C) 1181.25 yd  
D) 472.5 yd

Use a proportion to solve the problem.

21) The ratio of the lengths of strings that play the notes F and G is 9 to 8. If a string 40 centimeters long plays a G, what is the length of the string that plays an F? Express your answer as an integer or mixed number.

A) \(\frac{5}{9}\) centimeters  
B) 48 centimeters  
C) 45 centimeters  
D) 49 centimeters

22) If a spring stretches 7 meters when a weight of 8- kilograms is attached to it, how much will it stretch when a weight of 56- kilograms is attached to it?

A) 52 meters  
B) 48 meters  
C) 51 meters  
D) 49 meters
Solve the proportion.

23) \( \frac{5}{y} = \frac{20}{12} \)

A) 3       B) 8.3       C) 0.12       D) 30

24) \( \frac{5}{x} = \frac{9}{x + 8} \)

A) 10       B) 2       C) \( \frac{4}{3} \)       D) \( \frac{4}{7} \)

25) \( \frac{1}{2} = \frac{r}{17} \)

A) 0.03       B) 34       C) 17       D) 8.5

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Provide an appropriate response.

26) The price of an item is reduced by 20% in a sale. Two weeks later the price is increased to 20% more than the sale price. Do you think that the item has been restored to its original price? If not, do you think its price is now higher or lower than the original price? Explain your thinking.

27) Fill in the blanks.

66% represents ___ parts out of ___ equal parts.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Write as a percent.

28) 0.983

A) 0.983%       B) 0.983%       C) 983%       D) 98.3%

29) 8.9

A) 0.89%       B) 890%       C) 0.0089%       D) 89%

Write the fraction as a percent.

30) \( \frac{37}{40} \)

A) 37.00%       B) 74.00%       C) 92.5%       D) 9.25%

31) \( \frac{18}{20} \)

A) 90%       B) 80%       C) 95%       D) 100%

Write the percent as a decimal.

32) 35.5%

A) 0.245       B) 0.0355       C) 0.355       D) 3.55

33) 505%

A) 0.505       B) 50.5       C) 5.06       D) 5.05
Write the percent as a fraction in the lowest terms.

34) \(7.5\%\)
A) \(\frac{3}{40}\)  
B) \(\frac{3}{80}\)  
C) \(\frac{3}{20}\)  
D) \(\frac{3}{4}\)  

35) \(488\%\)
A) \(\frac{4\ 22}{22}\)  
B) \(\frac{4\ 22}{50}\)  
C) \(\frac{4\ 22}{25}\)  
D) \(\frac{4\ 22}{35}\)

For the restaurant bill, estimate the tip. Then find the exact amount of the tip. State your answers to the nearest hundredth.

36) The restaurant bill is \$45.70. Give the estimate of a 20% tip and the exact amount of a 20% tip.
A) Estimate: \$5.00  
   Exact: \$4.57  
B) Estimate: \$7.50  
   Exact: \$6.86  
C) Estimate: \$10.00  
   Exact: \$9.14  
D) Estimate: \$2.50  
   Exact: \$2.29

37) The restaurant bill is \$43.72. Give the estimate of a 15% tip and the exact amount of a 15% tip.
A) Estimate: \$2.00  
   Exact: \$2.19  
B) Estimate: \$8.00  
   Exact: \$8.74  
C) Estimate: \$4.00  
   Exact: \$4.37  
D) Estimate: \$6.00  
   Exact: \$6.56

Solve the problem. If the answer is an amount of money, round to the nearest dollar.

38) A chemical solution contains \(3\%\) salt. How much salt is in \(4.5\) ml of solution?
A) \(0.135\) ml  
B) \(15\) ml  
C) \(1.35\) ml  
D) \(150\) ml

39) At a university, \(60\%\) of the students who apply are accepted. Of those who are accepted, \(70\%\)
actually enroll. If \(30,000\) students apply, how many actually enroll?
A) \(28,700\) students  
B) \(29,870\) students  
C) \(12,600\) students  
D) \(17,400\) students

Solve the problem. Round your answer to the nearest tenth of a percent unless otherwise indicated.

40) A carpeted living room and dining room area measures \(32\) ft by \(10\) ft. Mark decides to install
wood flooring in the \(12\) ft by \(10\) ft dining room. By what percent has he reduced the area that is
carpeted?
A) \(10\%\)  
B) \(60\%\)  
C) \(37.5\%\)  
D) \(62.5\%\)

41) Last year, Maria earned \$314 per week. This year, her salary increased to \$334 per week. What
is the percent of increase?
A) \(93.6\%\)  
B) \(94\%\)  
C) \(6.4\%\)  
D) \(6\%)
Find the percent of the figure that is shaded.

42) ______

A) 2.51%  B) 25.1%  C) 251%  D) 51%

43) ______

A) 5.1%  B) 0.51%  C) 50%  D) 51%

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Provide an appropriate response.

44) Fill in the blanks.

When the interest is ________ interest and interest rates double, a person will make twice as much money. However, when the interest is ________ interest and interest rates double, a person will make more than twice as much money.
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the simple interest for the indicated length of time.

45) $7211 at 12% interest for 1.7 years
   A) $1471.04
   B) $774.23
   C) $1384.51
   D) $2336.36

46) $49,438 at 9.8% interest for 22 months
   A) $9286.10
   B) $8882.36
   C) $8478.62
   D) $8957.00

Solve the problem.

47) Find the amount of money in an account after 12 years if $1000 is deposited at 5% annual interest compounded quarterly.
   A) $1808.73
   B) $1795.86
   C) $1819.85
   D) $1815.35

48) Barbara knows that she will need to buy a new car in 4 years. The car will cost $15,000 by then. How much should she invest now at 10%, compounded quarterly, so that she will have enough to buy a new car? Round to the nearest cent.
   A) $10,104.37
   B) $12,340.54
   C) $9313.82
   D) $11,269.72

Solve the problem. Assume that simple interest is being calculated in each case. Round your answer to the nearest cent.

49) John forgot to pay his $364.00 income tax on time. The IRS charged a penalty of 12% for the 55 days the money was late. Find the penalty that John paid. (Use a 365 day year.)
   A) $1.56
   B) $6.58
   C) $370.58
   D) $6.46

50) Annie's cafe borrows $9300 at 8% for 50 days. Find the total amount that must be repaid after the 50 days. (Use a 365 day year.)
   A) $9310.19
   B) $9401.92
   C) $10,044.00
   D) $10,319.18
1) (i) $3 : 6$
   (ii) $9 : 6$
   (iii) $3 : 9$
   Objective: (7.1) *Know Concepts: Ratio
2) B
   Objective: (7.1) Complete Table of Equivalent Ratios
3) D
   Objective: (7.1) Convert Units and Express Ratio in Simplest Form
4) A
   Objective: (7.1) Convert Units and Express Ratio in Simplest Form
5) D
   Objective: (7.1) Express Ratio in Simplest Form
6) A
   Objective: (7.1) Express Ratio in Simplest Form
7) D
   Objective: (7.1) Re-express Ratios
8) D
   Objective: (7.1) Re-express Ratios
9) C
   Objective: (7.1) Solve Apps: Determine Best Buy
10) B
    Objective: (7.1) Solve Apps: Determine Best Buy
11) C
    Objective: (7.1) Solve Apps: Ratios
12) A
    Objective: (7.1) Solve Apps: Ratios
13) D
    Objective: (7.1) Solve Apps: Ratios II
14) A
    Objective: (7.1) Solve Apps: Unit Price
15) B
    Objective: (7.1) Solve Apps: Unit Price
16) You cannot solve this problem using a proportion because the ratio of age to hair length is not constant. She could cut or trim her hair.
    Objective: (7.2) *Know Concepts: Proportions
17) C
    Objective: (7.2) Find Unknown Length(s) in Pair of Similar Triangles
18) D
    Objective: (7.2) Find Unknown Length(s) in Pair of Similar Triangles
19) A
    Objective: (7.2) Solve Apps: Proportions I
20) A
    Objective: (7.2) Solve Apps: Proportions I
21) C
    Objective: (7.2) Solve Apps: Proportions II
22) D
    Objective: (7.2) Solve Apps: Proportions II
23) A
    Objective: (7.2) Solve Proportion
24) A
    Objective: (7.2) Solve Proportion
25) D
    Objective: (7.2) Solve Proportion
26) Answers will vary. Possible answer: The item has not been restored to its original price. Its price is now lower than the original price. The amount of the increase was less than the amount of the discount because 20% of the sale price is a smaller amount than 20% of the original price.
    Objective: (7.3) *Know Concepts: Percent
27) 66, 100
    Objective: (7.3) *Know Concepts: Percent
28) D
    Objective: (7.3) Convert Decimal to Percent
29) B
    Objective: (7.3) Convert Decimal to Percent
30) C
    Objective: (7.3) Convert Fraction to Percent
31) A
    Objective: (7.3) Convert Fraction to Percent
32) C
    Objective: (7.3) Convert Percent to Decimal
33) D
    Objective: (7.3) Convert Percent to Decimal
34) A
    Objective: (7.3) Convert Percent to Fraction
35) C
    Objective: (7.3) Convert Percent to Fraction
36) C
    Objective: (7.3) Estimate and Calculate Restaurant Tips
37) D
    Objective: (7.3) Estimate and Calculate Restaurant Tips
38) A
    Objective: (7.3) Solve Apps: Miscellaneous Percent Apps
39) C
    Objective: (7.3) Solve Apps: Miscellaneous Percent Apps
40) C
   Objective: (7.3) Solve Apps: Percent Increase or Decrease

41) C
   Objective: (7.3) Solve Apps: Percent Increase or Decrease

42) C
   Objective: (7.3) Write Percent Represented by Shaded Area of Figure

43) D
   Objective: (7.3) Write Percent Represented by Shaded Area of Figure

44) simple; compound
   Objective: (7.4) *Know Concepts: Percent

45) A
   Objective: (7.4) Find Simple Interest

46) B
   Objective: (7.4) Find Simple Interest

47) D
   Objective: (7.4) Solve Apps: Compound Interest

48) A
   Objective: (7.4) Solve Apps: Compound Interest

49) B
   Objective: (7.4) Solve Apps: Simple Interest

50) B
   Objective: (7.4) Solve Apps: Simple Interest