Number Sense and Operations

Calculators may not be used.

Dan earned some money working for his uncle. He spent 1/3 of the money on magazines and ¼ of the money on a snack. Which of the following fractions represents the part of Dan's money he did **not** spend?

  A. $\dfrac{5}{12}$

  B. $\dfrac{1}{2}$

  C. $\dfrac{2}{3}$

  D. $\dfrac{5}{7}$

Which of the following inequalities is true?

  A. $\sqrt{3} > \pi$

  B. $\sqrt{9} > \pi$

  C. $\sqrt{5} > 2$

  D. $\sqrt{6} > 3$

What is the value of the expression below?
$(\sqrt{16})^2$

  A. 4

  B. 8

  C. 16

  D. 32

The rate of interest paid on savings accounts at a bank increased by $\dfrac{1}{2}$%. Which of the following shows $\dfrac{1}{2}$% written as a decimal?

  A. 0.0012

  B. 0.005

  C. 0.12

  D. 0.5

What is the value of the expression below?
$|8| + |-3| - |7|$

  A. -12

  B. -2

  C. 4

  D. 18

Hannah's mean score on four mathematics tests is 92.75. What is the sum of the scores of Hannah's four tests?

  A. 368

  B. 370

  C. 371

  D. 372

A survey showed that $\dfrac{3}{5}$ of a newspaper's readers had access to a computer during the day. What is $\dfrac{3}{5}$ written as a percent?

  A. 75%

  B. 60%

  C. 35%

  D. 30%

Which of the following is equivalent to the expression below?

$(-5 + 6) + 2$

  A. $-5(6 + 2)$

  B. $2(-5 + 6)$

  C. $-5 + (6 + 2)$

  D. $2 + (-6 + 5)$

What is the value of the expression below?

$4 - 2^3 \cdot 3$

A. −20

B. −14

C. 18

D. 24

Brian had 4/5 of a pizza left over from lunch. He divided his leftover pizza equally among 3 friends. The expression below represents the part of the whole pizza that each friend received.

$4/5 \div 3$

Which of the following expressions is equivalent to $4/5 \div 3$?

A. $\dfrac{1}{3} \div \dfrac{4}{5}$

B. $\dfrac{3}{1} \cdot \dfrac{4}{5}$

C. $\dfrac{4}{5} \div \dfrac{1}{5}$

D. $\dfrac{4}{5} \cdot \dfrac{1}{3}$

Which of the following expressions has a value of 16?

A. $\sqrt{(8)^2}$

B. $\sqrt{(16)^2}$

C. $\left(\sqrt{32}\right)^2$

D. $\left(\sqrt{64}\right)^2$

The list below shows the interest rates for car loans at four different car dealerships.

$7\dfrac{1}{2}\%, \quad 7.4\%, \quad 7\dfrac{3}{8}\%, \quad 7.2\%$

Which of the following lists shows the interest rates in order from least to greatest?

A. $7.2\%, \ 7\dfrac{3}{8}\%, \ 7.4\%, \ 7\dfrac{1}{2}\%,$

B. $7.2\%, \ 7.4\%, \ 7\dfrac{3}{8}\%, \ 7\dfrac{1}{2}\%,$

C. $7\dfrac{1}{2}\%, \ 7.2\%, \ 7\dfrac{3}{8}\%, \ 7.4\%$

D. $7\dfrac{1}{2}\%, \ 7\dfrac{3}{8}\%, \ 7.2\%, \ 7.4\%$

Which of the following lists is in order from least to greatest?

A. $\sqrt{3}, \pi, 3$

B. $\sqrt{3}, 3, \pi$

C. $3, \pi, \sqrt{3}$

D. $3, \sqrt{3}, \pi$

The Adams Middle School girls' basketball team won 5 games and lost 3 games. What percent of all of these games did the team **lose**?

A. 30%

B. 37.5%

C. 60%

D. 62.5%

James drove 200 miles in 4 hours. At this rate, what is the total number of hours it will take him to drive 150 miles?

Which of the following is equivalent to the expression below?

17(83 − 16)

  A. 17(83) − 16

  B. (17 − 16)(83)

  C. 17(83) − 17(16)

  D. (17 − 83)(17 − 16)

What is the value of the expression below?

$50 - \sqrt{16} \cdot 4$

  A. 34

  B. 42

  C. 136

  D. 184

Between which two consecutive integers on the number line does $\sqrt{11}$ lie?

  A. 3 and 4

  B. 5 and 6

  C. 11 and 12

  D. 22 and 23

The minimum distance from Neptune to Earth is about 2.68 billion miles. What is 2.68 billion written in scientific notation?

  A. 2.68×10^6

  B. 2.68×10^7

  C. 2.68×10^9

  D. 2.68×10^{10}

Which of the following is a multiple of 12?

  A. 1

  B. 3

  C. 18

  D. 24

What is the value of the expression below?

$$|15| + |-10|$$

  A. −25

  B. −5

  C. 5

  D. 25

Mr. Lee has one mathematics class with 16 students and one with 24 students. He wants to divide each class into groups with the same number of students in each group. What is the greatest number of students Mr. Lee can have in each group?

  A. 2

  B. 4

  C. 6

  D. 8

Which of the following is equivalent to the expression below?

3(1.50) + 3(2.50)

  A. 3(1.50 + 2.50)

  B. 3(1.50)(2.50)

  C. 3(1.50 + 3)2.50

  D. 3(3) + (1.50)(2.50)

What is the value of the expression below?

$$\sqrt{36} + 13 \cdot 2$$

  A. 32

  B. 38

  C. 62

  D. 98

Which of the following expressions is **not** equivalent to –7?

A. $(-4 - 3)$

B. $-(4 + 3)$

C. $|-4 - 3|$

D. $-|4 + 3|$

Which of the following is equivalent to the expression below?

$$\frac{2}{3} \div \frac{3}{4}$$

A. $\frac{2}{3} \div \frac{4}{3}$

B. $\frac{2}{3} \cdot \frac{4}{3}$

C. $\frac{3}{2} \div \frac{3}{4}$

D. $\frac{3}{2} \cdot \frac{3}{4}$

Mr. Johnson noted that $\frac{3}{8}$ of the students at his school were in the band. He also noted that $\frac{1}{2}$ of the students in the band were girls. What fractional part of the students at the school were girls in the band?

Which of the following is the prime factorization of 72?

A. $2^3 \cdot 3^2$

B. $2^4 \cdot 3^3$

C. $8 \cdot 3^2$

D. $2^3 \cdot 9$

The Enescu family rented 4 movies at a video store. The length, in hours, of each of the movies is shown below.

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

What is the total length of the 4 movies?

A. $5\frac{8}{14}$ hours

B. $6\frac{1}{4}$ hours

C. $6\frac{4}{6}$ hours

D. $7\frac{1}{4}$ hours

When Lisa first started exercising, she could exercise for only 8 minutes. Yesterday, she exercised for 15 minutes. Which of the following proportions could be used to determine the percent increase in Lisa's exercise time?

A. $\frac{x}{100} = \frac{8}{7}$

B. $\frac{8}{x} = \frac{7}{100}$

C. $\frac{100}{x} = \frac{7}{8}$

D. $\frac{x}{100} = \frac{7}{8}$

Sandra bought $2\frac{5}{8}$ pounds of apples. Which of the following shows $2\frac{5}{8}$ written in decimal notation?

A. 2.375

B. 2.580

C. 2.625

D. 2.875

4

Martin correctly answered 90% of the questions on a math test that contained exactly 40 questions. How many of the questions did he answer **incorrectly**?

A. 4

B. 10

C. 44

D. 90

Jerry wants to copy five files onto a compact disc (CD). The CD can hold a total of 700 megabytes of data. The size, in megabytes, of each of Jerry's files is shown in the chart below.

Sizes of Jerry's Files

File Number	Size of File (megabytes)
1	47.76
2	58.32
3	178.99
4	110.55
5	96.75

a. What is the difference, in megabytes, between the largest and smallest of the five files? Show or explain how you got your answer.

b. Jerry estimated that the total number of megabytes in the five files was about 500 megabytes. Do you agree or disagree with Jerry's estimate? Show or explain how you got your answer.

c. Based on Jerry's estimate, what percent of the 700 total megabytes that the CD can hold will be left after Jerry copies these five files to the CD? Show or explain how you got your answer.

Carrie recorded the temperature outside her school at the same time each day for four days.

- On Monday, the temperature was 11°F.

- On Tuesday, the temperature was 15°F **less than** the temperature on Monday.

- On Wednesday, the temperature was 3°F **greater than** the temperature on Tuesday.

- On Thursday, the temperature was 4°F **greater than** the temperature on Wednesday.

a. Complete the table below using the information Carrie recorded. Show or explain how you got each of your answers.

**Temperatures Outside
Carrie's Schools**

Day	Temperature
Monday	11°F
Tuesday	
Wednesday	
Thursday	

b. What was the difference, in degrees Fahrenheit, between the temperature on Monday and the temperature on Wednesday? Show or explain how you got your answer.

Carrie also recorded the temperature outside her school on Friday. She calculated that the mean temperature for the 5 days, Monday through Friday, was 2°F.

c. What was the temperature, in degrees Fahrenheit, on Friday? Show or explain how you got your answer.

Calculators may be used on the following questions.

At 6:00 p.m., the temperature was –14.8°F. During the night, the temperature decreased by 8.7°F. What was the temperature after the decrease?

A. –23.5°F

B. –22.5°F

C. –6.1°F

D. –5.9°F

Mona counted a total of 56 ducks on the pond in Town Park. The ratio of female ducks to male ducks that Mona counted was 5:3. What was the total number of female ducks Mona counted on the pond?

A. 15

B. 19

C. 21

D. 35

Tuan answered 20 customer service calls in 3 hours. At this rate, how many customer service calls can Tuan answer in 7.5 hours?

A. 45

B. 50

C. 60

D. 80

Which of the following is more likely to be an estimate than an exact number?

A. the balance due on a telephone bill

B. the population of deer in the state of Massachusetts

C. the change a customer receives when making a purchase

D. the number of cans of tomato soup that a store manager orders

What is 150% of 48?

A. 72

B. 32

C. 7.2

D. 3.2

Jaime used 5 ½ tablespoons of lemonade mix to make 2 quarts of lemonade. At this rate, what is the total number of tablespoons of lemonade mix that Jaime will use to make 3 quarts of lemonade?

A. $6\dfrac{1}{2}$

B. $8\dfrac{1}{4}$

C. $10\dfrac{1}{2}$

D. $16\dfrac{1}{4}$

For an assembly, 105 chairs will be set up using the fewest possible rows.

- There will be the same number of chairs in each row.

- There will be more than one row of chairs.

What will be the number of **chairs** in each row?

A. 3

B. 5

C. 21

D. 35

At the beginning of the school year, the principal at Adams Middle School equally divided each of the following items among the new teachers:

- 48 red pens
- 40 whiteboard markers
- 16 whiteboard erasers

There were no items remaining.

What was the maximum possible number of new teachers at Adams Middle School at the beginning of the school year?

A. 2

B. 4

C. 8

D. 16

A florist sells bouquets of carnations. He creates bouquets of different sizes by using 4 white carnations for every 3 pink carnations in a bouquet.

a. Write a proportion that can be used to find p, the number of pink carnations in a bouquet with w white carnations.

b. What is the number of pink carnations in a bouquet with 16 white carnations? Show or explain how you got your answer.

c. The florist made a bouquet with a total of 35 carnations in it.

- What is the total number of pink carnations in the bouquet?
- What is the total number of white carnations in the bouquet?

Show or explain how you got your answers.