Developing Conceptual Understanding of Number

Set G: Decimal, Fraction and Percent

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Decimal, Fraction and Percent 1

Vocabulary

- decimal point

Notes

- For #1, students should use estimation to find the answer. For example, in 1a), the answer is approximately 2 × 2 or 4 so 3.960 is the only answer close to 4.

Answers

1. a) 3.960
   b) 9.39
   c) 3.48936
   d) 83.75

2. a) <
   b) >
   c) >
   d) >

3. 6.4 + 1.9 > 8 because 1.9 is approximately 2 and 6.4 + 2 = 8.4

4. a) 0.5, $\frac{5}{10}$ or $\frac{1}{2}$, 50%
   b) 0.25, $\frac{25}{100}$ or $\frac{1}{4}$, 25%
   c) 0.75, $\frac{3}{4}$, 75%

Decimal, Fraction and Percent 1

1. Without finding the answer, place the decimal point in the correct position to make a true statement.
   a) 2.2 x 1.8 = 3960

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   b) 6.4 + 2.99 = 939
   c) 16.4 ÷ 4.7 = 348936
   d) 100.15 – 16.4 = 8375

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2. Use < or > to make each statement correct.
   a) 362 x 0.8 ____ 362
   b) 2.2 x 1.8 ____ 3

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   c) 160 ÷ 9.8 ____ 16
   d) 14.98 ÷ 0.98 ____ 14

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3. Without finding the exact answer, determine whether 6.4 + 1.9 is greater than or less than 8. Explain your thinking.

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4. Express each given number as a decimal, fraction, and percent.
   a) 0.5
   b) 25%

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   c) $\frac{3}{4}$

Decimal, Fraction and Percent 2

Vocabulary

Notes

Answers

1. a) $\frac{75}{100}$ or $\frac{3}{4}$, 0.75, 75%

   b) $\frac{4}{10}$ or $\frac{2}{5}$, 0.4, 40%

   c) $\frac{3}{12}$ or $\frac{1}{4}$, 0.25, 25%

2. a) 11.875

   b) 101.42

   c) 323.500

   d) 136.90

3. a) 6

   b) 0

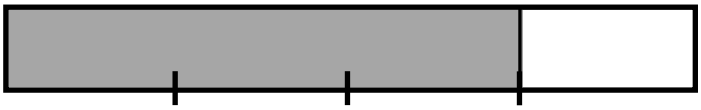
   c) 9

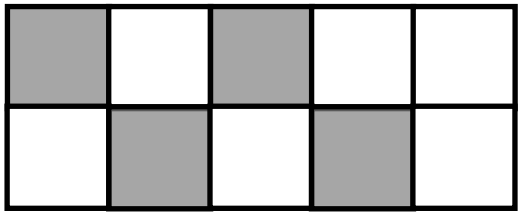
   d) 7

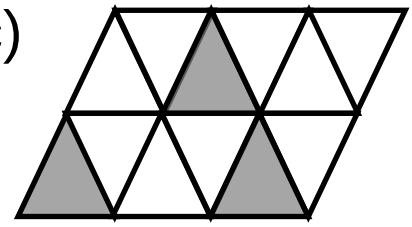
4. It is less than 349 because you are multiplying by a positive number less than one.

Decimal, Fraction and Percent 2

1. Give the fraction, decimal, and percent value for the shaded part of each figure.

   a) 

   b) 

   c) 

2. Without finding the answer, place the decimal point in the correct position to make a true statement.
   a) 28.5 ÷ 2.4 = 11875
   b) 16.41 + 3.94 + 81.07 = 10142
   c) 647 x 50% = 323500
   d) 160 – 19.1 – 4 = 13690

3. For the number 2607.19 what digit:
   a) is in the hundred's place?
   b) represents tens?
   c) is in the hundredth's position?
   d) represents ones?

4. Is 349 x 0.9 greater than, less than, or equal to 349? How do you know?

Decimal, Fraction and Percent 3

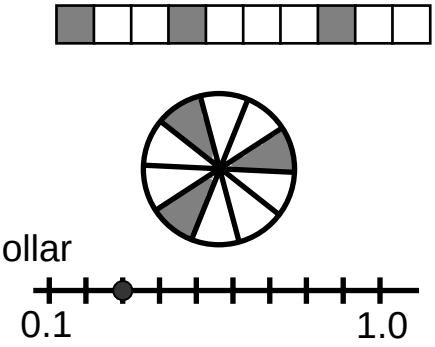
Vocabulary

Notes

- For #1, students can show their answers using a poster.

Answers

1. Possible Answers:
   - Three-tenths
   - Zero decimal three
   - 30%
   - $\frac{3}{10}$
   - $\frac{30}{100}$
   - 0.30 of a dollar
   - $3 \div 10$
   - $1 - 0.7$
   - …



2. Possible Answers:
   - Think of $20 as four $5 bills and then take three of them.
   - Find half of $20 (50%) and then find half again (25%). Add your answers.
   - Think of $20 as 2000 cents, split that into one hundred equal parts. Take 75 of the equal parts.
   - Find $\frac{1}{4}$ of $20 and subtract that value from $20.
   - …

Decimal, Fraction and Percent 3

1. Express 0.3 in eight different ways. Use words, symbols, operations, and diagrams. Give two examples of each.

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2. Find 75% of $20.
   Show how to get your answer 3 different ways.

Decimal, Fraction and Percent 4

Vocabulary

Notes

- For #4, this is a review from set F.

Answers

1. a)152.85714
   b) 272.430
   c) 390.16600
   d) 3.2020202

2. The answer would be greater than 3.
   Possible Explanations:
   - When I take 48 items and split them equally into 16 groups, I have exactly 3 in each group. But, If I split them evenly into only 15 groups, then I have more than 3 in each group.
   - …

3. a) 160
   b) 43 100
   c) 67.9
   d) 830
   e) 3800

4. a) 90°
   b) 59°
   c) 149°
   d) $\angle 1$ and $\angle 3$
   or
   $\angle 2$ and $\angle 4$

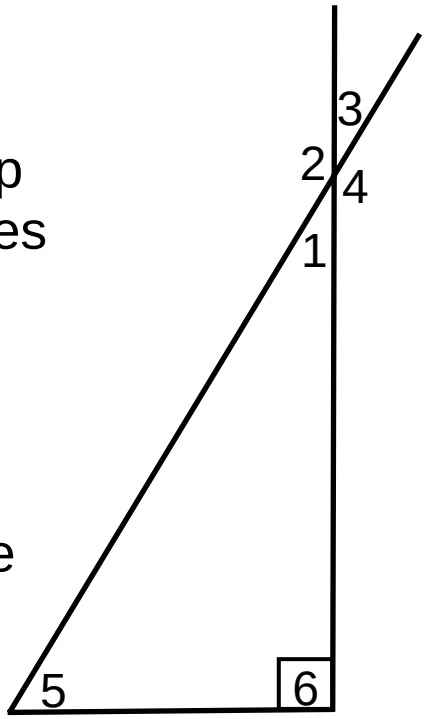
Decimal, Fraction and Percent 4

1. Without finding the answer, place the decimal point in the correct position to make a true statement.
   a) 149.8 ÷ 0.98 = 15285714
   b) 2.7 x 100.9 = 272430
   c) 40.6 x 9.61 = 39016600
   d) 317 ÷ 99 = 32020202

2. Suppose you know that 48 ÷ 16 = 3. Without finding the exact answer, tell whether the answer to 48 ÷ 15 is greater than, less than, or equal to 3. Why?

3. Do each calculation mentally:
   a) 16 x 10
   b) 431 x 100
   c) 6.79 x 10
   d) 8.3 x 100
   e) 3.8 x 1000

4. Use the diagram on the right to help answer the questions below. All lines are straight and ∠1 = 31°.
   a) How big is ∠6?
   b) How big is ∠5?
   c) What is the measure of ∠4?
   d) Name two angles which are the same size.



Decimal, Fraction and Percent 5

Vocabulary

Notes

- For 1d), think of this question as (4 × 25) × 3.8 or 100 × 3.8
- For 1e), think of this question as $\frac{1}{2}$ of 20 (or 10) times 29

Answers

1. a) 1960 b) 47.2
   c) 8030 d) 380
   e) 290

2. a) Subtract 50 b) Subtract 0.9
   c) Subtract 800

3. a) Possible Answers:
   49, 48, 47, etc. (Answer is slightly less than half of 98)
   b) Possible Answers:
   97, 90, 89, etc. (Answer is less than 98)
   c) Possible Answers:
   99, 100, etc. (Answer is slightly larger than 98)

4. a) Possible Answers:
   31, 32.5, 35, etc.
   b) Possible Answers:
   3.41, 3.5, 3.615, etc.
   c) Possible Answers:
   $\frac{1}{3}$, 0.30, 0.45, etc.

5. Possible Answers:
   - Twenty nickels
   - 5 pennies, 14 nickels, 1 quarter
   - 10 pennies, 8 nickels, 2 quarters
   - 15 pennies, 2 nickels, 3 quarters

Decimal, Fraction and Percent 5

1. Do each calculation mentally:
   e) 196 x 10
   f) 4.72 x 10
   g) 80.3 x 100
   h) 4 x 3.8 x 25
   i) 0.5 x 29 x 20

2. The following numbers are showing on a calculator screen. What single calculation would replace the circled digit with a zero? The other digits must not change.
   a) 6 5 4
   b) 147.9
   c) 2831.6

3. Estimate the answer when you multiply 98 by:
   a) 0.48?
   b) 0.9?
   c) 1.01?

4. Name a number that is between:
   a) 6 x 5 and 36
   b) 3.4 and 3.62
   c) $\frac{1}{4}$ and $\frac{1}{2}$

5. The value of 20 coins adds up to $1. Find one solution for this problem.

Decimal, Fraction and Percent 6

Vocabulary

Notes

- For #4, this question is a review of Set F.

Answers

1. a)16.644444
   b) 2697.8400
   c) 309.9270
   d) 0.32020202

2. It is greater than 3 because when you divide by a smaller number, you get a larger answer.

3. a) 520
   b) 40 100
   c) 810
   d) 671
   e) 380

4. a) 53°
   b) $\angle 1$ and $\angle 4$ OR
   $\angle 2$ and $\angle 3$ OR
   $\angle 1$ and $\angle 5$ and $\angle 6$
   c) $\angle 1$ and $\angle 3$ OR
   $\angle 2$ and $\angle 4$
   d) $\angle 5$ and $\angle 6$

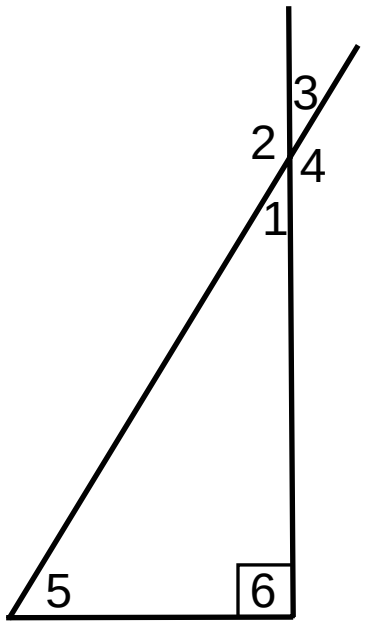
Decimal, Fraction and Percent 6

1. Without finding the answer, place the decimal point in the correct position to make a true statement.
   a) 14.98 ÷ 0.9 = 16644444
   b) 2.7 x 999.2 = 26978400
   c) 30.9 x 10.03 = 3099270
   d) 31.7 ÷ 99 = 32020202

2. Suppose you know that 48 ÷ 16 = 3. Without finding the exact answer, tell whether the answer to
   48 ÷ 15.99 is greater than, less than, or equal to 3. Why?

3. Do each calculation mentally:
   a) 52 x 10
   b) 401 x 100
   c) 8.1 x 100
   d) 67.1 x 10
   e) 4 x 3.8 x 25

4. Use the diagram on the right to help answer the questions that follow.
   All lines are straight and ∠1 = 37°
   c) What is the measure of ∠5?
   d) List angles that are supplementary.
   e) List a pair of angles that are the same size.
   f) What two angles in the triangle would have a sum equal to the measure of ∠2?



Decimal, Fraction and Percent 7

Vocabulary

Notes

- For 1d), think of this question as (4 × 25) × 2.8 or 100 × 2.8
- For 1e), think of this question as (0.2 × 50) × 1997 or 10 × 1997
- For #3, students should be encouraged to estimate the relative size of the answer rather than memorize a rule.

Answers

1. a) 2600 b) 403
   c) 8010 d) 280
   e) 19 970

2. a) Subtract 0.09 b) Subtract 800
   c) Subtract 0.2

3. a) Your answer is slightly larger than half.
   b) Your answer is 100 times larger so move the decimal two to the right.
   c) Your answer is smaller by a factor of 10 so move the decimal 1 place to the left.

4. a) Possible Answers:
   28.5, 29, 29.1, etc.
   b) Possible Answers:
   14.581, 14.59, etc.
   c) Possible Answers:
   $\frac{5}{12}, \frac{4}{10}$, 0.35, 0.455, etc.

5. Possible Answers:
   - Twenty nickels
   - 5 pennies, 14 nickels, 1 quarter
   - 10 pennies, 8 nickels, 2 quarters
   - 15 pennies, 2 nickels, 3 quarters

Decimal, Fraction and Percent 7

1. Do each calculation mentally:
   e) 260 x 10
   f) 4.03 x 100
   g) 80.1 x 100
   h) 4x 2.8 x 25
   i) 0.2 x 1997 x 50

2. The following numbers are showing on a calculator screen. What single calculation would replace the circled digit with a zero? All other digits cannot change.
   a) 1 . 4 (9) 6
   b) 1 5 (8) 5 7 . 3
   c) 6 0 . (2) 9

3. In general, what happens when you:
   d) multiply a whole number by 0.51?
   e) multiply a decimal number by 100?
   f) divide a decimal number by 10?

4. Name a number that is between:
   d) 4 x 7 and 3 x 10
   e) 14.58 and 14.6
   f) $\frac{1}{3}$ and $\frac{1}{2}$

5. The value of 20 coins adds up to $1. Find two different solutions for this problem.