Year 8 fractions, decimals and percentages worksheet

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Name: _____ Date: _____

Question 1

Convert 9/16 to a decimal and state whether it is terminating or recurring.

Answer: _____

Question 2

Convert each number into the two other forms (fraction in simplest form, decimal, percentage).

(a) ⅜

(b) 0.64

(c) 145%

Answer: _____

Question 3

Convert 5/12 to a recurring decimal. Write your answer using dot notation.

Answer: _____

Question 4

Write ⅞ as a percentage.

Answer: _____

Question 5

A recipe needs 7/9 of a litre of olive oil. A shop sells olive oil in bottles labelled 0.7777… litres and 0.777…888… litres. Which bottle size exactly matches the amount the recipe needs? Show all working.

Answer: _____

Question 6

Write 0.045 as a percentage.

Answer: _____

Question 7

Convert 7/11 to a recurring decimal using dot notation.

Answer: _____

Question 8

Write 135% as a decimal.

Answer: _____

Question 9

Round 3.14159 to three decimal places.

Answer: _____

Question 10

Write 12.5% as a decimal.

Answer: _____

Year 8 fractions, decimals and percentages: answers and worked solutions

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Question 1

Key idea: If the denominator's only prime factors are 2s and 5s, the decimal terminates. Divide to find the decimal.

1. Check the denominator: $16 = 2^4$. Only 2s, so the decimal **terminates**. 2. Divide: $9 \div 16$.\ $9 \div 16 = 0.5625$ 3. Verify: $0.5625 \times 16 = 9$ ✓

Answer: 9/16 = 0.5625 (terminating decimal)

Question 2

Key idea: To change to a percentage, multiply by 100%. To change a percentage to a decimal or fraction, divide by 100.

1. (a) $3 \div 8 = 0.375$, and $0.375 \times 100\% = 37.5\%$ 2. (b) $0.64 = 64/100 = 16/25$, and $0.64 \times 100\% = 64\%$ 3. (c) $145\% = 145 \div 100 = 1.45$ 4. (c) $1.45 = 145/100 = 19/20$

Answer: (a) 0.375 = 37.5% (b) 16/25 = 64% (c) 1.45 = 19/20

Question 3

Key idea: Divide the numerator by the denominator. When a remainder repeats, the decimal recurs. Use a dot above the first and last repeating digit.

1. Check the denominator: $12 = 2^2 \times 3$. It has a factor of 3 (not just 2s and 5s), so the decimal **recurs**. 2. Perform the division $5 \div 12$:\ $5 \div 12 = 0.41666\ldots$ 3. The digit 6 repeats forever, so the recurring part is just 6. 4. In dot notation, place one dot above the 6: 0.41666...

Answer: 5/12 = 0.41666...

Question 4

Key idea: Multiply by 100%.

1. $⅞ \times 100\% = 700/8\% = 87.5\%$

Answer: 87.5%

Question 5

Key idea: Convert 7/9 to a recurring decimal and compare with the two bottle labels.

1. Check the denominator: $9 = 3^2$. It has no factors of 2 or 5, so the decimal recurs. 2. Divide: 7 ÷ 9 = 0.7777… 3. Write in dot notation: 0.777… 4. Compare with the bottle labels:

- 0.7777… = 0.7777… = 0.777… ✓
- 0.777…888… = 0.787878… ✗

5. The first bottle, 0.7777… litres, matches 7/9 exactly.

Answer: The 0.7777… litre bottle exactly matches the recipe.

Question 6

Key idea: Multiply by 100%, which moves the decimal point two places to the right.

1. 0.045 × 100% = 4.5%

Answer: 4.5%

Question 7

Key idea: Divide the numerator by the denominator, identify the repeating block, and place dots above the first and last digits of that block.

1. Check the denominator: 11 is prime and not 2 or 5, so the decimal **recurs**. 2. Perform the division 7 ÷ 11:\ 7 ÷ 11 = 0.636363… 3. The block 63 repeats forever. 4. Place a dot above the 6 (first repeating digit) and a dot above the 3 (last repeating digit): 0.666…333… 5. Verify: 0.666…333… × 11 = 6.999…333… ÷ … Quick check: 0.6363… × 11 = 7 ✓

Answer: 7/11 = 0.666…333…

Question 8

Key idea: Divide by 100, which moves the decimal point two places to the left.

1. 135 ÷ 100 = 1.35

Answer: 1.35

Question 9

Key idea: Look at the fourth decimal digit to decide whether to round up.

1. The fourth decimal digit is 5, so round the third digit up 2. 3.141 → 3.142

Answer: 3.142

Question 10

Key idea: Divide by 100.

1. 12.5 ÷ 100 = 0.125

Answer: 0.125