

# Fractions, Decimals and Rational Number Word Problems

Grade 7 math · Worksheet Answer Key · Standards: 7.NS.A.2d, 7.NS.A.3

Each answer shows the division steps or the sign decision, then the result in bold. Compare your work step by step and watch for sign slips or a dropped repeating digit, which are the most frequent errors.

**Standards:** 7.NS.A.2d, 7.NS.A.3 · **Level:** Grade 7

## Problem 1 Terminating Fraction by Long Division

Divide 7.000 by 8:  $70 \div 8 = 8$  remainder 6;  $60 \div 8 = 7$  remainder 4;  $40 \div 8 = 5$  remainder 0.

$$\begin{array}{r}
 \phantom{0} \mathbf{0} . \mathbf{8} \mathbf{7} \mathbf{5} \\
 8 \overline{) 7 . 0 0 0} \\
 \underline{64} \phantom{0} \\
 60 \phantom{0} \\
 \underline{56} \phantom{0} \\
 40 \phantom{0} \\
 \underline{40} \\
 0
 \end{array}$$

*Long division of 7 by 8.*

$$\frac{7}{8} = \mathbf{0.875}$$

## Problem 2 Convert a Fraction Over 25

$11 \div 25$ :  $110 \div 25 = 4$  remainder 10;  $100 \div 25 = 4$  remainder 0. Check:  $0.44 \times 25 = 11$ .

$$\frac{11}{25} = \mathbf{0.44}$$

## Problem 3 A Repeating Ninth

$50 \div 9 = 5$  remainder 5, and the remainder 5 returns at once, so the digit 5 repeats.

$$\frac{5}{9} = 0.555... = \mathbf{0.5}$$

#### Problem 4 Twelfths as Decimals

$70 \div 12 = 5$  remainder 10;  $100 \div 12 = 8$  remainder 4;  $40 \div 12 = 3$  remainder 4. The remainder 4 repeats, so the digit 3 repeats from then on.

$$\begin{array}{r} \mathbf{0.5833} \\ 12 \overline{) 7.0000} \\ \underline{60} \phantom{00} \\ 100 \phantom{0} \\ \underline{96} \phantom{0} \\ 40 \phantom{0} \\ \underline{36} \phantom{0} \\ 40 \phantom{0} \\ \underline{36} \phantom{0} \\ 4 \phantom{0} \end{array}$$

*Long division of 7 by 12.*

$$\frac{7}{12} = \mathbf{0.58\overline{3}}$$

#### Problem 5 Predict the Decimal Type

- $40 = 2 \cdot 2 \cdot 2 \cdot 5$ , only 2s and 5s: **terminates**.
- $18 = 2 \cdot 3 \cdot 3$  includes a 3: **repeats**.
- $\frac{14}{35}$  reduces to  $\frac{2}{5}$ , and 5 is allowed: **terminates**.
- $22 = 2 \cdot 11$  includes an 11: **repeats**.

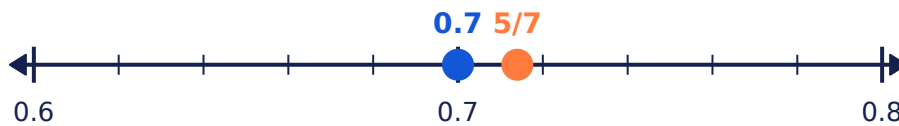
#### Problem 6 Mixed Number to Decimal

$30 \div 11 = 2$  remainder 8;  $80 \div 11 = 7$  remainder 3; the remainder 3 returns, so the block is 27. Add the whole number 2.

$$2\frac{3}{11} = \mathbf{2.2\overline{7}}$$

#### Problem 7 Fraction Versus Decimal

$50 \div 7 = 7$  remainder 1;  $10 \div 7 = 1$  remainder 3;  $30 \div 7 = 4$  remainder 2, so  $\frac{5}{7} = 0.714...$  which is more than 0.700.



The point for  $5/7$  lies just right of 0.7.

$5/7$  is greater than 0.7.

### Problem 8 Mixed Signs, One Sum

Write  $5\frac{3}{4}$  as 5.75. Different signs:  $5.75 - 3.4 = 2.35$ , and the larger size is positive.

**2.35**

### Problem 9 Product of Two Negatives

Same signs give a positive product.  $2.5 \times 1.6 = 4.00$  ( $2.5 \times 1 = 2.5$  and  $2.5 \times 0.6 = 1.5$ ).

**4**

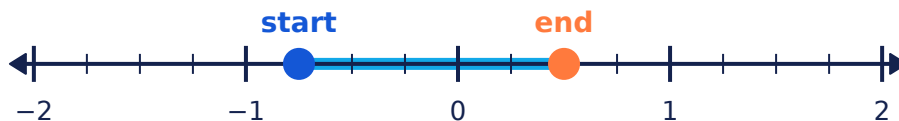
### Problem 10 Dividing by a Negative Fraction

$-3/5 = -0.6$ . Same signs give a positive quotient.  $7.2 \div 0.6 = 72 \div 6 = 12$ .

**12**

### Problem 11 Subtracting a Negative

Subtracting  $-1.25$  means adding 1.25:  $-0.75 + 1.25 = 0.5$ , a move of 1.25 units to the right.



The jump of  $+1.25$  lands at 0.5.

**0.5**, which equals  $\frac{1}{2}$ .

### Problem 12 Three Terms with Mixed Forms

Write the mixed number as 2.25. Then  $-4.5 + 2.25 = -2.25$ , and  $-2.25 + 0.8 = -1.45$ .

**-1.45**

### **Problem 13 Length of the Repeating Block**

Remainders:  $10 \div 7 = 1 \text{ r } 3$ ;  $30 \div 7 = 4 \text{ r } 2$ ;  $20 \div 7 = 2 \text{ r } 6$ ;  $60 \div 7 = 8 \text{ r } 4$ ;  $40 \div 7 = 5 \text{ r } 5$ ;  $50 \div 7 = 7 \text{ r } 1$ . The remainder 1 returns, so  $1/7 = 0.142857\ 142857\dots$  and the block 142857 has 6 digits.

$20 = 3 \times 6 + 2$ , so the 20th digit is the 2nd digit of the block: 4.

**6 digits; the 20th digit is 4**

### **Problem 14 Nested Operations**

$-2/3 + 1/2 = -4/6 + 3/6 = -1/6$ . Then  $-1/6 \div (-1/4) = 1/6 \times 4 = 4/6$ .

$2/3 = 0.\overline{6}$

### **Problem 15 Morning Temperature Swings**

$-8.5 + 17.75 = 9.25$  at noon. Then  $9.25 - 5.2 = 4.05$ .

**4.05°F**

### **Problem 16 Overdrawn Account**

$-23.40 + 60 = 36.60$ . Bills:  $3 \times 12.85 = 38.55$ . Then  $36.60 - 38.55 = -1.95$ .

**-\$1.95** (the account is overdrawn by \$1.95)

### **Problem 17 Rice for the Food Truck**

$12\frac{3}{4} = 12.75$ . Divide:  $12.75 \div 0.375 = 12,750 \div 375 = 34$ . Check:  $34 \times 0.375 = 12.75$ .

**34 servings**

### **Problem 18 Drone Flight Height**

Descent:  $-2.75 \times 8 = -22$ . Climb:  $1.5 \times 6 = 9$ . Height:  $45 - 22 + 9 = 32$ .

**32 feet**

### Problem 19 Net Yardage per Play

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Net:  $-3.5 + 8.25 = 4.75$ ;  $4.75 - 2.75 = 2$ ;  $2 + 11 = 13$ ;  $13 - 0.5 = 12.5$ . Mean:  $12.5 \div 5 = 2.5$ .

**Net 12.5 yards; mean 2.5 yards per play**

### Problem 20 Splitting the Tab

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$86.50 \div 6$ :  $6 \times 14 = 84$ , remainder 2.5. Then  $2.5 \div 6 = 0.41666\dots$ , so each share is  $14.41666\dots = 14.41\bar{6}$ .

Rounded: \$14.42. Total paid:  $6 \times 14.42 = 86.52$ , which is  $86.52 - 86.50 = 0.02$  too much.

**Share =  $\$14.41\bar{6} \approx \$14.42$ ; the group overpays by \$0.02**