

Grade 7 · Rational Numbers: Decimals, Fractions and Word Problems · Worksheet Answer Key

Common Core 7.NS.A.2d, 7.NS.A.3 · mathovore.fr

Each solution shows the long division remainders or the running calculation, so you can find the exact step where an error began. Check signs first, then check the size of every answer against a quick estimate.

Grade 7 Common Core: 7.NS.A.2d · 7.NS.A.3

Problem 1: Fractions to decimals

- a. $3 \div 5 = 0.6$.
- b. $70 \div 8 = 8 \text{ r } 6$, $60 \div 8 = 7 \text{ r } 4$, $40 \div 8 = 5 \text{ r } 0$. So 0.875.
- c. $90 \div 20 = 4 \text{ r } 10$, $100 \div 20 = 5 \text{ r } 0$. So 0.45.

(a) 0.6 (b) 0.875 (c) 0.45

Problem 2: Long division to decimals

- a. $90 \div 25 = 3 \text{ r } 15$, $150 \div 25 = 6 \text{ r } 0$. So 0.36.
- b. $110 \div 16 = 6 \text{ r } 14$, $140 \div 16 = 8 \text{ r } 12$, $120 \div 16 = 7 \text{ r } 8$, $80 \div 16 = 5 \text{ r } 0$. So 0.6875.
- c. $130 \div 40 = 3 \text{ r } 10$, $100 \div 40 = 2 \text{ r } 20$, $200 \div 40 = 5 \text{ r } 0$. So 0.325.

(a) 0.36 (b) 0.6875 (c) 0.325

Problem 3: Repeating decimals

$\frac{2}{3}$: $20 \div 3 = 6 \text{ r } 2$, and the remainder 2 returns, so $0.\bar{6}$.

$\frac{5}{6}$: $50 \div 6 = 8 \text{ r } 2$, $20 \div 6 = 3 \text{ r } 2$, and the remainder 2 returns, so $0.8\bar{3}$.

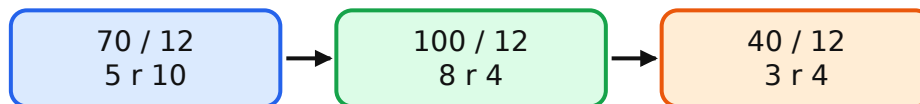
$$\begin{array}{r}
 \text{0 . 8 3 3} \\
 6 \overline{) 5 . 0 0 0} \\
 \underline{-48} \text{remainder 2} \\
 20 \\
 \underline{-18} \text{remainder 2} \\
 20 \\
 \underline{-18} \text{remainder 2}
 \end{array}$$

The remainder 2 repeats, so $\frac{5}{6} = 0.8\bar{3}$.

$$\frac{2}{3} = 0.\bar{6} \text{ and } \frac{5}{6} = 0.8\bar{3}$$

Problem 4: Repeating digits

- a. $50 \div 9 = 5 \text{ r } 5$, and the remainder 5 returns. So $0.\bar{5}$.
 b. $70 \div 12 = 5 \text{ r } 10$, $100 \div 12 = 8 \text{ r } 4$, $40 \div 12 = 3 \text{ r } 4$, and the remainder 4 returns. So $0.58\bar{3}$.
 c. $40 \div 11 = 3 \text{ r } 7$, $70 \div 11 = 6 \text{ r } 4$, and the remainder 4 returns, so the digits 36 repeat: $0.\bar{36}$.



The remainder 4 repeats, so the digit 3 repeats in $7/12$.

(a) $0.\bar{5}$ (b) $0.58\bar{3}$ (c) $0.\bar{36}$

Problem 5: Terminate or repeat

- a. $70 \div 20 = 3 \text{ r } 10$, $100 \div 20 = 5 \text{ r } 0$: 0.35, terminates.
 b. $40 \div 9 = 4 \text{ r } 4$, the remainder 4 returns: $0.\bar{4}$, repeats.
 c. $110 \div 12 = 9 \text{ r } 2$, $20 \div 12 = 1 \text{ r } 8$, $80 \div 12 = 6 \text{ r } 8$: $0.91\bar{6}$, repeats.
 d. $90 \div 16 = 5 \text{ r } 10$, $100 \div 16 = 6 \text{ r } 4$, $40 \div 16 = 2 \text{ r } 8$, $80 \div 16 = 5 \text{ r } 0$: 0.5625, terminates.

Fraction	Decimal	Type
$7/20$	0.35	terminates
$4/9$	0.444...	repeats
$11/12$	0.91666...	repeats
$9/16$	0.5625	terminates

Denominators 20 and 16 use only the factors 2 and 5.

(a) 0.35, terminates (b) $0.\bar{4}$, repeats (c) $0.91\bar{6}$, repeats (d) 0.5625, terminates

Problem 6: Mixed numbers

- a. Convert the fraction part: $30 \div 8 = 3 \text{ r } 6$, $60 \div 8 = 7 \text{ r } 4$, $40 \div 8 = 5 \text{ r } 0$, so $\frac{3}{8} = 0.375$. Then $2\frac{3}{8} = 2.375$.
- b. $50 \div 6 = 8 \text{ r } 2$, $20 \div 6 = 3 \text{ r } 2$, so $\frac{5}{6} = 0.8\bar{3}$. Then $3\frac{5}{6} = 3.8\bar{3}$, and the sign gives $-3.8\bar{3}$.
- c. $70 \div 20 = 3 \text{ r } 10$, $100 \div 20 = 5 \text{ r } 0$, so $\frac{7}{20} = 0.35$. Then $1\frac{7}{20} = 1.35$.

(a) 2.375 (b) $-3.8\bar{3}$ (c) 1.35

Problem 7: Negative fractions

- a. $70 \div 11 = 6 \text{ r } 4$, $40 \div 11 = 3 \text{ r } 7$, $70 \div 11 = 6 \text{ r } 4$, so the digits 63 repeat: $\frac{7}{11} = 0.\overline{63}$. Keep the sign: $-0.\overline{63}$.
- b. $\frac{13}{8} = 1 \text{ r } 5$, then $50 \div 8 = 6 \text{ r } 2$, $20 \div 8 = 2 \text{ r } 4$, $40 \div 8 = 5 \text{ r } 0$: 1.625. So -1.625 .

(a) $-0.\overline{63}$ (b) -1.625

Problem 8: Add and subtract decimals

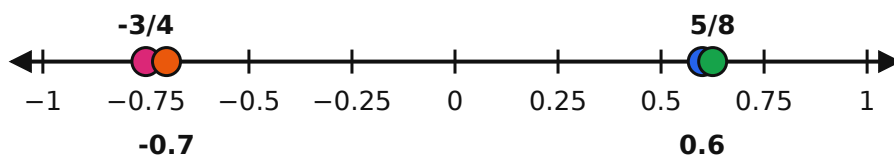
- a. Different signs: $9.75 - 6.4 = 3.35$, and 9.75 has the larger absolute value, so 3.35.
- b. Subtracting a negative is adding: $2.8 + 4.15 = 6.95$.
- c. Both are moves to the left: $-(7.25 + 3.6) = -10.85$.
- d. $-0.75 + 1.5 = 0.75$.

(a) 3.35 (b) 6.95 (c) -10.85 (d) 0.75

Problem 9: Order on a number line

Write each as a decimal: 0.6; $-\frac{3}{4} = -0.75$; $\frac{5}{8} = 0.625$; -0.7 .

Negatives first: -0.75 is less than -0.7 . Then positives: 0.6 is less than 0.625.



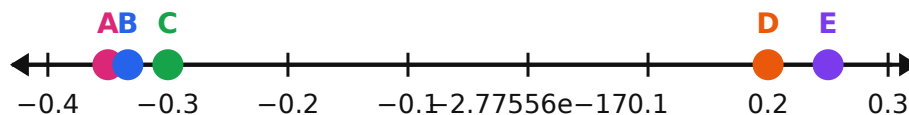
Points from left to right.

$-\frac{3}{4}$, -0.7 , 0.6 , $\frac{5}{8}$

Problem 10: Ordering mixed forms

Write each as a decimal: $\frac{1}{4} = 0.25$; -0.3 ; 0.2 ; $-\frac{1}{3} = -0.\bar{3} \approx -0.333$; -0.35 .

Negatives: -0.35 is less than -0.333 , which is less than -0.3 . Positives: 0.2 is less than 0.25 .



The five numbers from left to right.

$A = -0.35$, $B = -\frac{1}{3}$, $C = -0.3$, $D = 0.2$, $E = \frac{1}{4}$.

-0.35 , $-\frac{1}{3}$, -0.3 , 0.2 , $\frac{1}{4}$

Problem 11: Four operations

- Different signs: $3.5 - 2.25 = 1.25$, sign of the larger absolute value (negative): -1.25 .
- $\frac{3}{4} + \frac{1}{2} = \frac{3}{4} + \frac{2}{4} = \frac{5}{4}$.
- $-\frac{2 \times 9}{3 \times 10} = -\frac{18}{30} = -\frac{3}{5}$.
- $\frac{5}{6} \times \frac{12}{5} = \frac{60}{30} = 2$; same signs give a positive result.

(a) -1.25 (b) $\frac{5}{4}$ (c) $-\frac{3}{5}$ (d) 2

Problem 12: Add and subtract fractions

- $-\frac{8}{20} + \frac{15}{20} = \frac{7}{20}$.
- $\frac{5}{6} + \frac{2}{6} = \frac{7}{6} = 1\frac{1}{6}$.
- $-\frac{3}{8} - \frac{4}{8} = -\frac{7}{8}$.
- $-\frac{3}{2} + \frac{9}{4} = -\frac{6}{4} + \frac{9}{4} = \frac{3}{4}$.

(a) $\frac{7}{20}$ (b) $1\frac{1}{6}$ (c) $-\frac{7}{8}$ (d) $\frac{3}{4}$

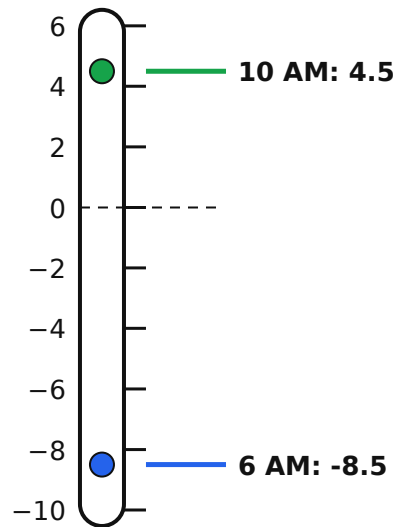
Problem 13: Multiply and divide

- Same signs give a positive: $1.5 \times 4.2 = 6.3$.
- Different signs give a negative: $-\frac{3 \times 10}{5 \times 9} = -\frac{30}{45} = -\frac{2}{3}$.
- $12.6 \div 3 = 4.2$, and the signs are different, so -4.2 .
- $\frac{7}{8} \times \left(-\frac{4}{7}\right) = -\frac{28}{56} = -\frac{1}{2}$.

(a) 6.3 (b) $-\frac{2}{3}$ (c) -4.2 (d) $-\frac{1}{2}$

Problem 14: Temperature rise

Total rise: $4 \times 3.25 = 13$. New temperature: $-8.5 + 13 = 4.5$.



A rise of 13 degrees.

4.5°F

Problem 15: Account balance

$$42.50 - 18.75 = 23.75; 23.75 + 25.20 = 48.95; 48.95 - 31.95 = 17.00.$$

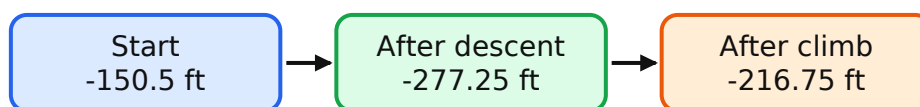
Transaction	Amount	Balance
Start	\$42.50	\$42.50
Spend	-\$18.75	\$23.75
Deposit	+\$25.20	\$48.95
Spend	-\$31.95	\$17.00

The running balance.

\$17.00

Problem 16: Death Valley hike

- $3 \times (-42.25) = -126.75$ feet.
- $-150.5 + (-126.75) = -277.25$ feet.
- $-277.25 + 60.5 = -216.75$ feet.

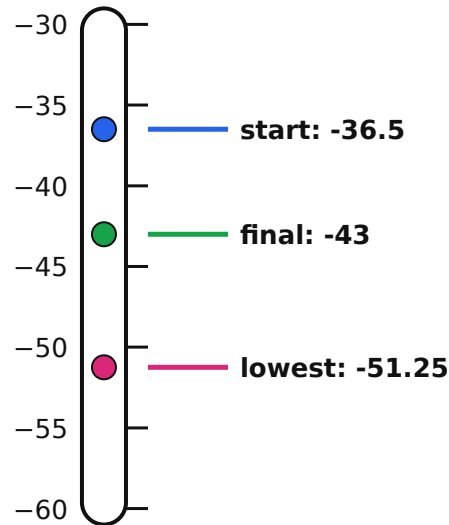


The running elevation.

Answers: **(a)** -126.75 ft **(b)** -277.25 ft **(c)** -216.75 ft.

Problem 17: Diver depth

Descending: $-36.5 - 14.75 = -51.25$. Rising: $-51.25 + 8.25 = -43$.



The diver's three depths.

-43 ft

Problem 18: Draining tank

- a. $6 \times (-2\frac{1}{4}) = 6 \times (-2.25) = -13.5$ gallons.
- b. $24 + (-13.5) = 10.5$ gallons.
- c. $24 \div 2.25 = \frac{24}{2.25} = \frac{96}{9} = \frac{32}{3}$ hours. Long division: $32 \div 3 = 10$ r 2, $20 \div 3 = 6$ r 2, and the remainder 2 returns, so $10.\bar{6}$ hours.

Check part (c): $2.25 \times 10\frac{2}{3} = 24$, because $2.25 \times 10 = 22.5$ and $2.25 \times \frac{2}{3} = 1.5$.

Answers: **(a)** -13.5 gal **(b)** 10.5 gal **(c)** $10.\bar{6}$ hours, or $10\frac{2}{3}$ hours.

Problem 19: Rate of change

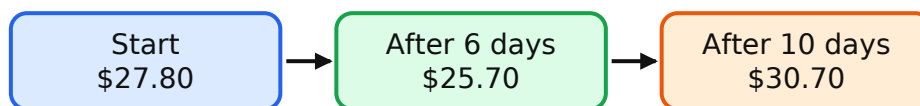
- a. $-6.5 - 14.5 = -21$.
- b. $-21 \div 6 = -3.5$ degrees per hour.
- c. $14.5 + 4 \times (-3.5) = 14.5 - 14 = 0.5$.

(a) -21°F **(b)** -3.5°F per hour **(c)** 0.5°F

Problem 20: Share price

- a. Change: $6 \times (-0.35) = -2.10$. Price: $27.80 - 2.10 = 25.70$.

- b. Change: $4 \times 1.25 = 5.00$. Price: $25.70 + 5.00 = 30.70$.
c. Net change: $30.70 - 27.80 = 2.90$, or $-2.10 + 5.00 = 2.90$.



The price at each stage.

Answers: **(a) \$25.70 (b) \$30.70 (c) a net increase of \$2.90.**