Chapter 4 review of decimals

The main topics in this chapter are rounding decimals, adding, subtracting, multiplying and dividing. Also scientific notation and percents. We'll look at examples next – go to the notes on each section for more.

Example ① Round 72.43625 to the nearest hundredth.

Solution: First write 72.4[3]625
round off place ↑ ↑ check if 0-4 or 5-9

Since the place to the right of the round off place is 5-9 we must add 1 to the [3] and get 72.44000
make zeros

Answer $\boxed{72.44}$

Example ② Find 17.4 − 5.63

Solution: For adding and subtracting decimals line up the decimal points

$$\begin{array}{r} 17.40 \\ -\ 5.63 \\ \hline \end{array}$$

$$\begin{array}{r} {\scriptstyle 6\ 13\ 10} \\ 17.\not{4}\not{0} \\ 5.63 \\ \hline 11.77 \end{array}$$
← borrow

Answer $\boxed{11.77}$

Example ③ Multiply 0.08 by 0.023

Solution: first count the places and add

$0.\underbrace{08}_{2\text{ places}}$ $0.\underbrace{023}_{3\text{ places}}$ $2+3=5$

Ignore the decimal points now and multiply

8×23

$$\begin{array}{r} 23 \\ \times\ 8 \\ \hline 184 \end{array}$$

now give answer 5 places

Answer $\boxed{0.00184}$ $00184.$

Example ④ Divide 1.918 by 0.7

Solution: First step is to get an equivalent question where we are dividing by a whole number

$$\frac{1.918 \times 10}{0.7 \times 10} = \frac{19.18}{7}$$

Can now divide and line up the decimal points

$$7\overline{)19.18} \qquad \begin{array}{r} 2.74 \\ 7\overline{)19.18} \\ -14 \\ \hline 51 \\ -49 \\ \hline 28 \\ -28 \\ \hline 0 \end{array}$$

Answer $\boxed{2.74}$

Example ⑤ Convert 0.000382 to scientific notation.

Solution: Move the decimal point to get a number between 1 and 10

0.000382 Answer $\boxed{3.82 \times 10^{-4}}$

Example ⑥ Convert 6% to a decimal, fraction.

Solution: 6% means $\frac{6}{100} = 0.06$ decimal

simplify ↳ $\frac{6 \div 2}{100 \div 2} = \frac{3}{50}$ fraction.

Example ⑦ In a sale, the price of a TV that usually sells for \$300 is reduced by 20%. Find the sale price.

Solution: First find 20% of 300

$$\frac{20}{100} \cdot \frac{300}{1} = \frac{6000}{100} = 60$$

So the price is reduced by \$60.

Answer: Sale price is $\boxed{\$240}$

Review of Chapter 5 Ratio, proportion.

A **ratio** compares two numbers, like a fraction
3 to 5, 3:5, $\frac{3}{5}$

A **proportion** says to ratios are equal $\frac{3}{5} = \frac{6}{10}$

A **rate** compares two different types of things like dollars to hours for pay.

Example ① Simplify these ratios
(a) 15:60 (b) $8\frac{1}{3} : 7\frac{1}{2}$

Solutions: (a) $\frac{15}{60} = \frac{15 \div 15}{60 \div 15} = \frac{1}{4}$ Ans **1:4**

(b) $\left(8\frac{1}{3}\right) \div \left(7\frac{1}{2}\right) = \frac{25}{3} \div \frac{15}{2}$

$= \frac{25}{3} \cdot \frac{2}{15} = \frac{50}{45} = \frac{50 \div 5}{45 \div 5} = \frac{10}{9}$

Answer **10:9**

Example ② Solve the proportion $\frac{15}{40} = \frac{12}{x}$

Solution: Step Ⓐ simplify $\frac{15}{40}$ to $\frac{3}{8}$

Step Ⓑ In $\frac{3}{8} = \frac{12}{x}$ set cross products equal:

$3x = 8 \cdot 12$

Step Ⓒ Divide both sides by 3 to get 1x

$\frac{3x}{3} = \frac{96}{3}$ Answer **x = 32**

In percent problems we use that

"A is P% of B" means $\frac{A}{B} = \frac{P}{100}$.

Example (3) 3 is 11% of what number? Give your answer as a mixed number.

Solution: Here $A = 3$, $P = 11$ and B is missing.

$\frac{3}{B} = \frac{11}{100}$ and solve this like example (2)

$3 \cdot 100 = 11B$ so $B = \frac{300}{11}$

$= 27\frac{3}{11}$ ←

$11\overline{)300}$ → 27, -22, 80, -77, 3

Answer: 3 is 11% of $27\frac{3}{11}$

Rates problems also become proportions:

Example (4) If a factory produces 45 cars in 6 days, how many are produced in 10 days?

Solution: $\frac{45 \text{ cars}}{6 \text{ days}} = \frac{X \text{ cars}}{10 \text{ days}}$

since we assume the rate of cars made per day is constant.

Now solve $\frac{45}{6} = \frac{X}{10}$

Can simplify $\frac{45}{6} = \frac{45 \div 3}{6 \div 3} = \frac{15}{2}$

so $\frac{15}{2} = \frac{x}{10}$ cross products $15 \cdot 10 = 2x$

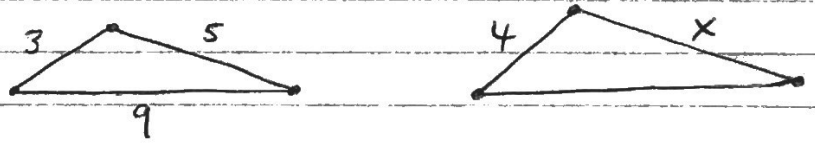
$\frac{2x}{2} = \frac{150}{2}$

$x = 75$

Answer: The factory makes $\boxed{75}$ cars in 10 days.

In similar triangles, ratios of corresponding sides are equal:

Example (5) If these triangles are similar, find x.



Solution: Similar means same shape and the corresponding sides are

$3 \longleftrightarrow 4$

$5 \longleftrightarrow x$

$9 \longleftrightarrow$ base of second triangle

Get $\frac{3}{4} = \frac{5}{x}$

Solve this proportion $3x = 4 \cdot 5$

$x = \frac{20}{3} = 6\frac{2}{3}$

Answer $\boxed{x = 6\frac{2}{3}}$