

Instructions: Record your answers to each of these problems directly on this page. Do the work on a separate page and attach these pages to this one. You should do the work by hand, but you may check your work with a calculator.

1. Simplify the expressions.

- a. What is 25% of 18,925? 4731.25
 b. What is 3% of 204 + 35% of 14,783? 5180.17

2. Fill in the following table with the missing fraction, decimal or percentage. Reduce all fractions to lowest terms.

	Fraction	Decimal	Percentage
a.	$\frac{1}{2}$	0.5	50%
b.	$\frac{9}{20}$.45	45%
c.	$\frac{1}{20}$	0.05	5%
d.	$\frac{1}{10}$	0.1	10%
e.	$\frac{2}{3}$	0.66	66 2/3%
f.	$\frac{1}{8}$.125	12.5%
g.	$\frac{2}{5}$	0.4	40%
h.	$\frac{3}{4}$	0.75	75%
i.	$\frac{1}{3}$.33	33 1/3%
j.	$\frac{33}{50}$	0.66	66%
k.	$\frac{1}{7}$	0.142857	14 2/7%

3. Writing decimals/whole numbers/fractions as percents

- a. Decimals to percents

i. $0.27 \rightarrow 27\%$

ii. $0.007 \rightarrow 0.7\%$

iii. $1.73 \rightarrow 173\%$

- b. Whole numbers to percents $4 \rightarrow 400\%$

- c. Fractions to percents

i. $\frac{67}{100} \rightarrow 67\%$

ii. $2\frac{1}{5} \rightarrow 220\%$

iii. $\frac{2}{3} \rightarrow 66\frac{2}{3}\%$

iv. $\frac{1}{4} \rightarrow 25\%$

v. $\frac{7}{4} \rightarrow 175\%$

vi. $\frac{5}{7} \rightarrow 71\frac{3}{7}\%$

4. Writing percents as fractions or decimals

- a. Percents to decimals

i. $37\% \rightarrow 0.37$

ii. $155\% \rightarrow 1.55$

iii. $15\frac{1}{3}\% \rightarrow 0.15\bar{3}$

iv. $26.5\% \rightarrow 0.265$

v. $0.5\% \rightarrow 0.005$

- b. Percents to fractions

i. $27\% \rightarrow \frac{27}{100}$

ii. $125\% \rightarrow \frac{5}{4}$

v. $15\% \rightarrow \frac{3}{20}$

vi. $7.5\% \rightarrow \frac{3}{40}$

iii. $\frac{1}{4}\% \rightarrow 0.0025$

vii. $4\frac{1}{4}\% \rightarrow 0.0425$

iv. $5\frac{1}{3}\% \rightarrow 0.05\bar{3}$

5. Write the percent as a decimal. a) 0.09% 0.0009 b) 109.4% 1.094
6. Write the decimal as a percent. a) 0.334 33.4% b) 0.024 2.4%
7. Write the fraction as a percent. a) $\frac{2}{10}$ 20% b) $\frac{5}{8}$ 62.5% c) $\frac{1}{3}$ $33\frac{1}{3}\%$
8. Write the percent as a fraction. a) $83\frac{1}{3}\%$ $\frac{5}{6}$ b) 4.85% $\frac{97}{2000}$
9. Express 0.00000000000008071 in scientific notation. 8×10^{-14}
 8.071×10^{-14}
10. Simplify and express $\frac{(1.38 \times 10^{12})(4.5 \times 10^{-16})}{1.15 \times 10^{10}}$ in scientific notation. 5.4×10^{-14}

11. For each of the fractions $\frac{7}{8}, \frac{4}{5}, \frac{7}{9}$,
a. determine whether the decimal form is terminating or repeating
terminating, terminating, repeating
b. place in the order smallest to largest.
 $\frac{7}{9}, \frac{4}{5}, \frac{7}{8}$

12. Write the ratio as a fraction. 3 to 2
 $\frac{3}{2}$
13. Simplify the ratio $\frac{8\frac{3}{4}}{9\frac{5}{6}} = \frac{105}{118}$

14. Determine which product size has the better unit price.

size	price	Unit price in cents/oz.
33 fl oz	\$3.97	$0.120\bar{3} \rightarrow 124$
50 fl oz	\$5.78	$0.1156 \rightarrow 11.6¢$

\leftarrow better (barely)

15. Solve the ratio for the unknown variable. $\frac{8}{9} = \frac{32}{x}$ $8x = 288$
 $x = 36$
16. Using simple interest, Bill borrowed \$10,000 at 9% for $\frac{1}{4}$ year. Find the interest due.
 $\$225$

17. Solve the following proportions.
- a. $\frac{740}{x} = \frac{35}{20}$ $14800 = 35x$ $x = 422\frac{6}{7}$
- b. $125:x :: 15:10$ $\frac{125}{x} = \frac{15}{10}$ $1250 = 15x$ $x = 83\frac{1}{3}$
- c. $\frac{x}{7} = \frac{8}{200}$ $200x = 56$ $x = 0.28$
- d. $7:30 :: 3:x$ $\frac{7}{30} = \frac{3}{x}$ $7x = 90$ $x = 12\frac{6}{7}$

18. Write the following expressions in scientific notation. You may round all figures to two significant figures.

- a. 0.00640 6.4×10^{-3}
 b. 130,009 1.3×10^5
 c. 436,027,791,000 4.4×10^{11}

19. Write each of the expressions in standard decimal form (not in scientific notation).

- a. 6.8×10^{-7} 0.00000068
 b. 2.54×10^{10} 25,400,000,000

20. Simplify the expression and write your final answer in scientific notation. Use two significant figures.

- a. $(5.75 \times 10^4)^3$ 1.9×10^{14}
 b. $(2.1 \times 10^{-3}) \div (9.8 \times 10^{-5})$ 21.428... 2.1×10^1

21. Calculate the following problems and write your answers to the indicated number of significant digits. You may use your calculator.

- a. (5 sig fig) $377.008 + 1.25581 + 98.066 = 476.33$
 b. (1 sig fig) $2.301 \div 0.07 = 30$
 c. (2 sig fig) $21.35 \times 4.8 = 100$

22. Determine the number of significant figures in the following numbers.

- a. 871.0 4
 b. 0.0913 3
 c. 0.0000128 3
 d. 833.009 6
 e. 20 1

23. Solve the following problems. State your answer with the correct significant digits.

- a. $65.23 + 2.345 + 0.098 + 23.11 = 91$ 2 sig fig
 b. $0.10954 - 0.00321 = 0.106$ 3 sig fig
 c. $0.75 \times 0.020 = 0.015$ 2 sig fig
 d. $2.103 \div 0.03 = 70$ 1 sig fig

24. Express the following numbers using standard scientific notation.

- a. 0.00037 3.7×10^{-4}
 b. 0.00000009 9×10^{-8}
 c. 75,000 7.5×10^4
 d. 1,400,000 1.4×10^6

25. Solve the following problems. Write your answer both in scientific notation and in decimal form with the correct significant digits.

- a. $(9.62 \times 10^3)(4.21 \times 10^2) = 4.05 \times 10^6$ 3 sig fig
 b. $(6.9 \times 10^{-3})(9.58 \times 10^1) = 0.66$ or 6.6×10^{-1} 2 sig fig
 c. $(2.31 \times 10^2) \div (8.9 \times 10^{-3}) = 2.6 \times 10^4$ 2 sig fig
 d. $(1.7 \times 10^{-3})^3 = 4.9 \times 10^{-9}$ 2 sig fig
 e. $(3.5 \times 10^{-2}) - (5.7 \times 10^{-3}) = 2.9 \times 10^{-2}$ 2 sig fig

26. Suppose you have a jar containing 5 green marbles, 7 blue ones, 11 red ones and 2 white marbles. Use this information to answer the following questions.

- a. How many marbles are in the jar? 25
- b. What is the probability of pulling a blue marble from the jar? $\frac{7}{25}$
- c. What is the probability of pulling first a blue marble from the jar, and without putting it back, then pulling a white marble from the jar? $\frac{7}{25} \cdot \frac{2}{24} = \frac{7}{300}$
- d. What is the probability of selecting either a green or a red marble on the first try?

$$\frac{16}{25}$$