Unit 1 · Ratios, Rate, Percent and Proportions Cheat Sheet

Unit 1 focus: ratios, unit rates, equivalent ratios and tables

1 KEY VOCABULARY

ratio	Compares two quantities.	3 to 5, 3 : 5, $\frac{3}{5}$
rate	A ratio of two different units.	150 miles in 3 hours
unit rate	A rate for 1 unit.	50 miles per hour
equivalent ratios	Same comparison; multiply or divide both parts by the same number.	2 : 3 = 8 : 12
proportion	Two equal ratios.	$\frac{2}{5} = \frac{6}{15}$

2 FINDING A UNIT RATE

Divide the first quantity by the second so the second becomes 1.

Example: \$7.20 for 6 pounds of apples. Price per pound?

Divide: $\frac{7.20}{6} = 1.20$

Answer: \$1.20 per pound

3 RATIO TABLES

Cups of flour	Cookies
2	24
4	48
6	72
1	12

Multiply or divide BOTH columns by the same number. Each row is an equivalent ratio.

4 COMPARING RATIOS

Write each as a unit rate (or find a common term), then compare.

Example: Which is the better buy: 12 oz for \$3 or 20 oz for \$4.40?

Unit prices: $\frac{3}{12} = 0.25$, $\frac{4.40}{20} = 0.22$ dollars per oz

Answer: 20 oz for \$4.40

5 SOLVING A PROPORTION

Use equivalent ratios or cross products.

Example: $\frac{3}{4} = \frac{x}{20}$

Scale: 4 × 5 = 20, so 3 × 5 = x

Answer: $x = 15$

6 QUICK REMINDERS & COMMON MISTAKES

✔ Do remember

- Order matters: 3 boys to 5 girls is 3 : 5, not 5 : 3.
- Units belong in the answer of a rate.
- A unit rate always has 1 in the second quantity.

✘ Common mistakes

- Adding to both parts: 2 : 3 → 4 : 5: multiply, do not add
- Dividing the wrong way for a unit price: price ÷ amount
- Mixing units: convert first

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More practice: proportions, percents and unit conversions

1 PERCENT BASICS

Percent	Fraction / decimal
50%	$\frac{1}{2} = 0.5$
25%	$\frac{1}{4} = 0.25$
10%	$\frac{1}{10} = 0.1$
75%	$\frac{3}{4} = 0.75$
120%	1.2

Percent means “per 100.”

2 PERCENT OF A NUMBER

Change the percent to a decimal, then multiply.

Example: Find 35% of 80.
Decimal: 35% = 0.35
Multiply: 0.35 × 80
Answer: 28

3 FINDING THE WHOLE

part = percent × whole, so whole = part ÷ percent.

Example: 18 is 30% of what number?
Divide: $\frac{18}{0.30}$
Answer: 60

4 A FRACTION AS A PERCENT

Make the denominator 100, or divide and multiply by 100.

Example: Write $\frac{7}{20}$ as a percent.
Scale: $\frac{7}{20} = \frac{35}{100}$
Answer: 35%

5 CONVERTING UNITS

Conversion	Use the ratio
1 ft = 12 in	$\frac{12\text{ in}}{1\text{ ft}}$
1 yd = 3 ft	$\frac{3\text{ ft}}{1\text{ yd}}$
1 gal = 4 qt	$\frac{4\text{ qt}}{1\text{ gal}}$
1 m = 100 cm	$\frac{100\text{ cm}}{1\text{ m}}$

Example: 5 ft × 12 in per ft = 60 in.

6 CHECK YOURSELF

- Did I write the ratio in the order the words say?
- Is my unit rate “per 1”?
- Does my percent answer make sense (less than the whole when under 100%)?
- Did my units cancel when converting?