

Name _____

Date _____

10.2 Percentages of a quantity — worksheet

Find a percentage of a quantity, using mental methods built from 10% and 1%. · 52 questions · Show your working.

Remember

- **10% is one tenth** — divide by 10. This is the building block for everything else.
- **1% is one hundredth** — divide by 100. From 1% you can build any percentage at all.
- **50%** is halving, **25%** is dividing by 4, **75%** is three quarters.
- Build the awkward ones: $35\% = 10\% + 10\% + 10\% + 5\%$.
- 5% is always half of 10%, and 2.5% is half of that.
- $p\%$ of n and $n\%$ of p are equal — both are $p \times n \div 100$. Use whichever is easier.
- Over 100% gives more than you started with: 150% of 200 is 300.
- To go backwards, find 1% first: if 30% is 24, then 1% is 0.8 and 100% is 80.

A · Fluency — Percentages of whole numbers and money.

1 Work out **50% of 80**.

2 Work out **25% of 60**.

3 Work out **10% of 90**.

4 Work out **20% of 45**.

5 Work out **75% of 40**.

6 Work out **5% of 300**.

7 Work out **10% of 250**.

8 Work out **50% of 36**.

9 Work out **25% of 48**.

10 Work out **20% of 150**.

11 Work out **75% of 200**.

12 Work out **5% of 80**.

13 Work out **15% of 60**.

14 Work out **35% of 80**.

15 Work out **12% of 50**.

16 Work out **30% of 70**.

17 Work out **45% of 120**.

18 Work out **60% of 85**.

19 Work out **8% of 250**.

20 Work out **65% of 40**.

21 Work out **18% of 150**.

22 Work out **95% of 60**.

23 Work out **10% of \$45.50**. Give the number of dollars.

24 Work out **20% of \$32.80**. Give the number of dollars.

25 Work out **25% of \$19.60**. Give the number of dollars.

26 Work out **5% of \$128.40**. Give the number of dollars.

27 Work out **50% of \$17.30**. Give the number of dollars.

28 Work out **15% of \$240.00**. Give the number of dollars.

B · Reasoning — The mental methods, and why they work.

29 What is the quickest way to find 10% of a number?

- ☐ Divide by 10
- ☐ Multiply by 10
- ☐ Divide by 100
- ☐ Subtract 10

30 What is the quickest way to find 1% of a number?

- ☐ Divide by 10
- ☐ Divide by 100
- ☐ Multiply by 100
- ☐ Subtract 1

- 31** How would you find 35% of a number without a calculator?
- ☐ Find 35 lots
 - ☐ Find 10%, treble it, then add half of the 10%
 - ☐ Divide by 35
 - ☐ Multiply by 3.5
- 32** Why is finding 50% the same as halving?
- ☐ It is not
 - ☐ 50% is $\frac{1}{2}$
 - ☐ 50 is half of 100 so it is a coincidence
 - ☐ Because $50 \times 2 = 100$
- 33** 25% of a number is the same as ...
- ☐ dividing by 4
 - ☐ dividing by 25
 - ☐ multiplying by 4
 - ☐ dividing by 2
- 34** Is 20% of 50 the same as 50% of 20?
- ☐ Yes
 - ☐ No
- 35** A quantity is 200 and you take 150% of it. Is the answer bigger or smaller than 200?
- ☐ Bigger
 - ☐ Smaller
 - ☐ The same
 - ☐ It cannot be done
- 36** Why is it useful to find 10% first?
- ☐ It is the easiest to work out and other percentages build from it
 - ☐ It is the biggest
 - ☐ It is always the answer
 - ☐ It is not useful

C · Challenge — Awkward percentages, and going backwards.

- 37** Find 17.5% of 240.
-
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- 38** Find 12.5% of 96.
-
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- 39** Find 65% of 180.
-
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- 40** 30% of a number is 24. What is the number?
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- 41** 15% of a number is 45. What is the number?
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- 42** A number increased by 10% gives 88. What was the number?
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D · Word problems — Discounts, rises and shares.

- 43** A jacket costs \$80 with 25% off. How much is taken off, in dollars?

- 44** A jacket costs \$80 with 25% off. What is the sale price, in dollars?

- 45** A class of 30 has 20% absent. How many are absent?

- 46** A bill of \$60 has 15% service added. How much is the service charge, in dollars?

- 47** A phone costs \$450 and the price rises by 8%. How much does it rise, in dollars?

- 48** A tank holds 240 litres and is 35% full. How many litres is that?

- 49** A town of 12 000 people grows by 5%. How many extra people?

- 50** A book of 320 pages has been 45% read. How many pages is that?

- 51** A salary of \$2400 rises by 12%. What is the rise, in dollars?

- 52** A shop takes 30% off a \$65 coat. What is the discount, in dollars?
