JUNIOR CYCLE MATHS · FREE REVISION SHEET

Percentages

↗ Léim

Learning outcomes (2018 specification): N.2a, N.2b. Play the game: **leim.ie/percent-pop.html**

1. Percent = out of 100

45% = 45/100 = 0.45. **% → decimal:** ÷ 100 (7% = **0.07**, not 0.7). **Decimal → %:** × 100 (0.375 = 37.5%). **Fraction → %:** make the bottom 100, or divide and × 100 (3/20 = 15/100 = 15%). **% → fraction:** over 100, then simplify (35% = 7/20).

Fraction	Decimal	%
1/2	0.5	50%
1/4	0.25	25%
3/4	0.75	75%
1/5	0.2	20%
1/10	0.1	10%
1/20	0.05	5%
1/8	0.125	12.5%
1/3	0.333…	33⅓%

2. A percentage of an amount

Build it from **10%** (÷ 10), **5%** (half of 10%) and **1%** (÷ 100). 35% of €80: 10% = €8, 30% = €24, 5% = €4, so 35% = **€28**. Calculator: 0.35 × 80. Swap trick: 8% of 25 = 25% of 8 = **2**.

3. One amount as a % of another

Fraction × 100: 18 out of 24 = 18/24 × 100 = **75%**. Same units first (350 g of 2 kg = 350/2000).

4. Increase and decrease

Change	Multiply by
decrease by 20%	**0.8** (you keep 80%)
increase by 15%	**1.15** (115%)
decrease by 4%	**0.96**
increase by 2.5%	**1.025**

5. Percentage change

Change ÷ **original** × 100. €50 → €60: 10 ÷ 50 × 100 = **20% increase**. Always divide by the starting amount.

6. Back to the start

After 20% off, a jacket costs €48. €48 is **80%**, so 1% = €0.60 and 100% = **€60** (or 48 ÷ 0.8).

Classic mistake: adding 20% back on: 48 × 1.2 = €57.60, not €60. The 20% was of the OLD price. Ask: "which amount is 100%?"

Exam tip: show the step ("10% = €8, so 30% = €24") because it earns marks even if the last line slips. Money has 2 decimal places (€57.60). Check the answer makes sense: a sale price must be less than the old price.

PRACTICE · 34 QUESTIONS

Have a go

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A. Fractions, decimals, %

1. Write 3/20 as a percentage. _____
2. Write 0.07 as a percentage. _____
3. Write 120% as a decimal. _____
4. Write 45% as a fraction in its simplest form. _____
5. Write 5/8 as a percentage. _____
6. Put in order, smallest first: 0.3, 2/5, 33%, 0.35 _____

B. Percentage of (no calculator)

7. 10% of 340 = _____
8. 5% of 340 = _____
9. 15% of 340 = _____
10. 25% of 64 = _____
11. 75% of 64 = _____
12. 1% of 850 = _____
13. 35% of 80 = _____
14. 12% of 250 = _____

C. Increase and decrease

15. Decrease €60 by 20% _____
16. Increase €40 by 15% _____
17. Decrease €250 by 8% _____
18. Increase €75 by 4% _____
19. To increase by 6%, multiply by... _____
20. To decrease by 35%, multiply by... _____
21. A €36 top is in a 25% off sale. Sale price? _____
22. €1,200 rent goes up by 2.5%. New rent? _____

D. As a percentage, percentage change, back to the start

23. Aoife got 42 out of 60 in a test. What percentage is that? _____
24. 18 of the 24 students in a class have a phone. What percentage is that? _____
25. Write €45 as a percentage of €180. _____
26. Write 350 g as a percentage of 2 kg. _____
27. A price goes from €80 to €92. Find the percentage increase. _____
28. A price goes from €250 to €200. Find the percentage decrease. _____
29. After 30% off, a coat costs €84. What was the original price? _____
30. 30% of a number is 27. What is the number? _____

Questions 31–34 are on the next page.

EXAM-STYLE · THEN CHECK

Exam corner + answers

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E. Exam-style questions (show your work)

31. A school has 560 students. 45% walk to school, 1/4 cycle and the rest come by bus. (a) How many come by bus? (b) What percentage come by bus?

32. A hoodie costs €95. Shop A takes 20% off. Shop B takes €15 off. (a) Which is cheaper, and by how much? (b) After the sale, Shop A puts its price back up to €95. Find the percentage increase.

33. After a 20% increase, a ticket costs €78. (a) What did it cost before? (b) Why is 20% off €78 the wrong method?

34. A €400 bike goes up by 10%, then the new price is cut by 10%. Is it back to €400? Explain.

Answers

A	1. 15% · 2. 7% · 3. 1.2 · 4. 9/20 · 5. 62.5% · 6. 0.3, 33%, 0.35, 2/5
B	7. 34 · 8. 17 · 9. 51 · 10. 16 · 11. 48 · 12. 8.5 · 13. 28 · 14. 30
C	15. €48.00 · 16. €46.00 · 17. €230.00 · 18. €78.00 · 19. 1.06 · 20. 0.65 · 21. €27.00 · 22. €1230.00
D	23. 70% · 24. 75% · 25. 25% · 26. 17.5% · 27. 15% · 28. 20% · 29. €120.00 · 30. 90
E	31. (a) 45% of 560 = 252; 1/4 of 560 = 140; bus 560 − 252 − 140 = **168** (b) 168/560 × 100 = **30%** · 32. (a) A: 0.8 × 95 = €76; B: €80. **Shop A, by €4** (b) 19 ÷ 76 × 100 = **25%** (not 20%: it's worked out on €76) · 33. (a) 120% = €78, 1% = €0.65, 100% = **€65** (b) 0.8 × 78 = €62.40: the 20% was of the OLD price, not €78 · 34. 400 × 1.1 = €440, then 440 × 0.9 = **€396**. **No**: the 10% cut is 10% of €440, a bigger amount

Got one wrong? Check: did you ÷ 100 properly (7% = 0.07)? For a percentage change, did you divide by the **original**? For "the price before", did you find 1% first instead of adding the % back on? Then play **Percent Pop** at leim.ie/percent-pop.html: the "Go back over these" list at the end shows the rule for each mistake.

All questions written by Léim. Léim is independent and not connected with the State Examinations Commission or the NCCA.