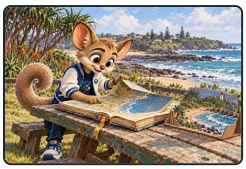
1. Percentages in your head



Name _____ Class _____ Date _____

Max's stop · Port Edward · coastal stop. At a picnic table above the rocky beach at Port Edward, Max opens the atlas at its gold tab and stands a little cardboard model of the coast beside it: the KwaZulu-Natal chapter begins.

> **Today:** 100% is the whole: find **50%, 25%, 10% or 1%** by dividing, then build any percentage from those pieces.

Warm-up A string on 240

Each answer helps with the next one. Fill in the model, then write the equation.

1 **a)** Work out **50% of 240**.

		÷ 2
%	100	50
amount	240	
		÷ 2

50% of 240 = 240 ÷ 2 = _____

b) Work out **10% of 240**.

		÷ 10
%	100	10
amount	240	
		÷ 10

10% of 240 = 240 ÷ 10 = _____

c) Work out **5% of 240**.

	÷ 10	÷ 2	
%	100	10	5
amount	240	24	
	÷ 10	÷ 2	

5% of 240 = 24 ÷ 2 = _____

d) Work out **1% of 240**.

	÷ 10	÷ 10	
%	100	10	1
amount	240	24	
	÷ 10	÷ 10	

1% of 240 = 24 ÷ 10 = _____

e) Work out **15% of 240**.

			10 + 5
%	10	5	15
amount	24	12	
			24 + 12

15% of 240 = 24 + 12 = _____

f) Work out **99% of 240**.

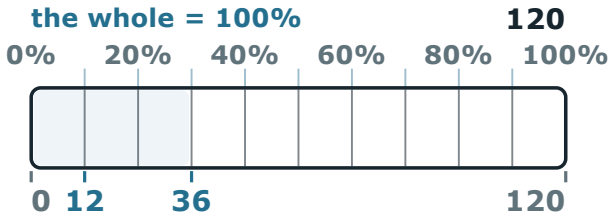
	× 100	− 1	
%	1	100	99
amount	2,4	240	
	× 100	− 2,4	

99% of 240 = 240 − 2,4 = _____

Percentages in your head

KNOWLEDGE **The pieces of 100%**

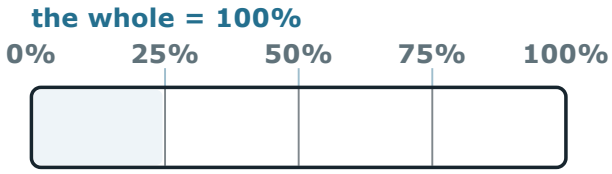
WORKED EXAMPLE **Work out 30% of 120.**



1. The whole bar is 120. Ten equal blocks of 10% make 100%, so one block is 120 ÷ 10 = **12**.
2. 30% is three blocks: 3 × 12 = **36**.

30% of 120 = 3 × 12 = 36

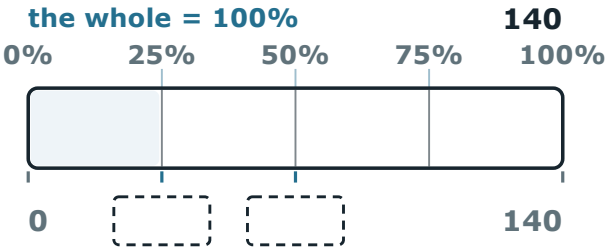
2 ★ The whole bar is 100%. **What fraction of the bar is 25%?** Write it in its simplest form.



25% = _____ : divide by _____

3 ★ Fill in or finish the model, then write the equation.

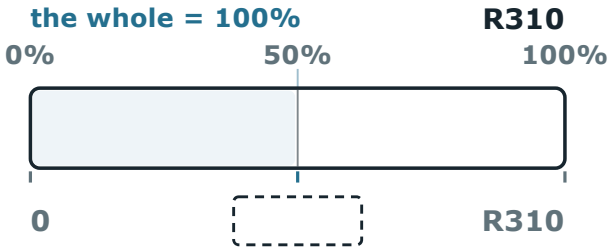
a) Work out **50% of 140**.
So what is 25% of 140?



50% of 140 = 140 ÷ 2 = _____

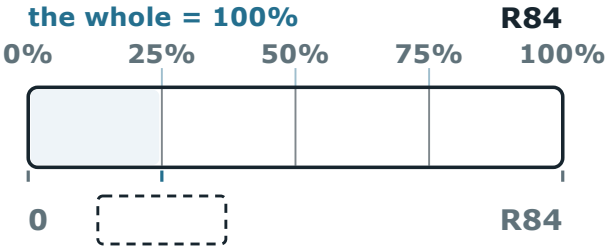
25% of 140 = 140 ÷ 4 = _____

b) Work out **50% of R310**.



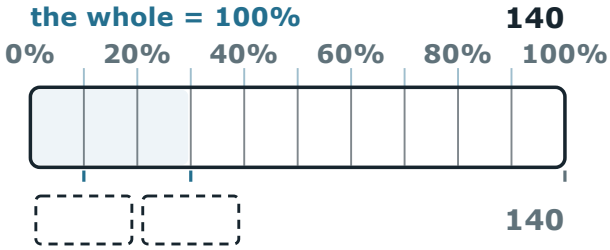
50% of R310 = R310 ÷ 2 = R_____

c) Work out **25% of R84**.



25% of R84 = R84 ÷ 4 = R_____

d) Work out **10% of 140**.
So what is 30% of 140?

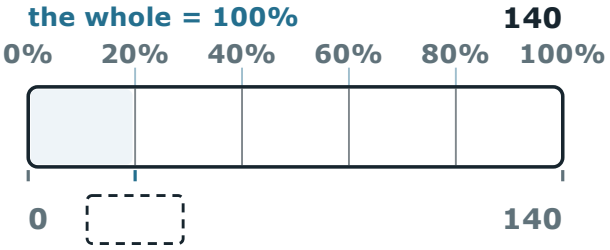


10% of 140 = 140 ÷ 10 = _____

30% of 140 = 3 × (140 ÷ 10) = _____

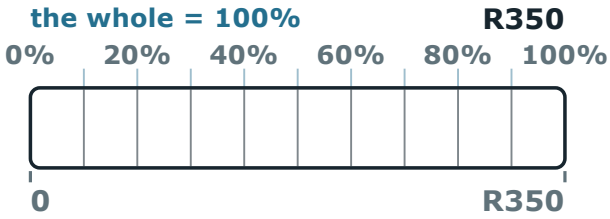
3 *Question 3 continued: fill in or finish the model, then write the equation.*

e) Work out **20% of 140**.



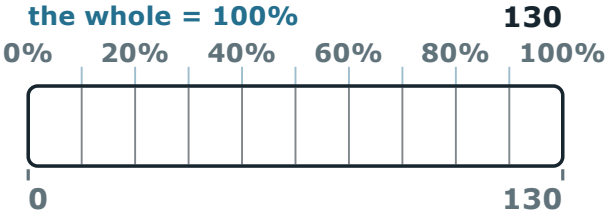
20% of 140 = 140 ÷ 5 = _____

f) Work out **10% of R350**.



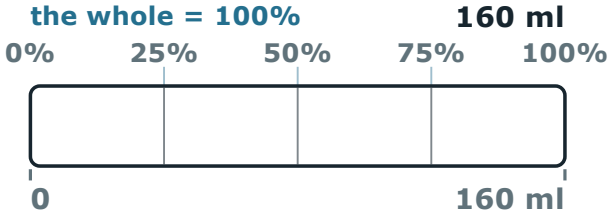
10% of R350 = R_____

g) Work out **40% of 130**.



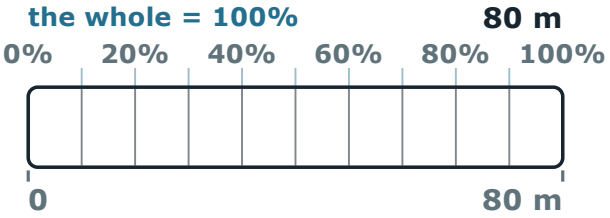
40% of 130 = _____

h) Work out **75% of 160 ml**.



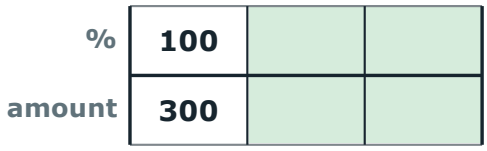
75% of 160 ml = _____ ml

i) Work out **5% of 80 m**.



5% of 80 m = _____ m

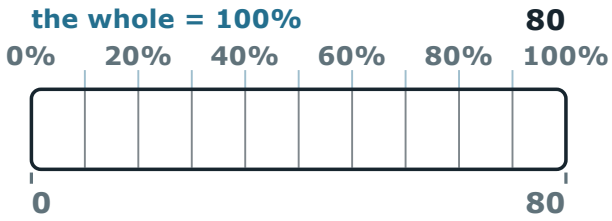
j) Work out **1% of 300**, and then **7% of 300**.



300 ÷ 100 = _____, then × 7 = _____

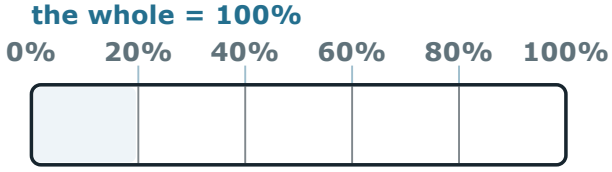
4 ★ Work out **35% of 80**. Build it from blocks of 10% and half a block.

35% of 80 = _____



5 ★ The whole bar is 100%. **What fraction of the bar is 20%?** Write it in its simplest form.

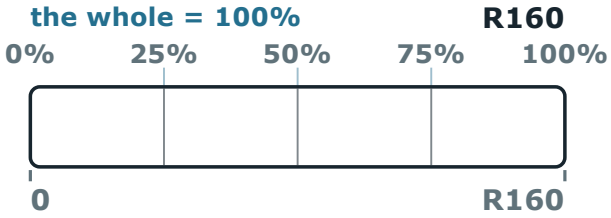
20% = _____ : divide by _____



Percentages in your head

6 ★ Finish the model, or draw your own. Then write the equation.

a) Work out **12,5% of R160**.



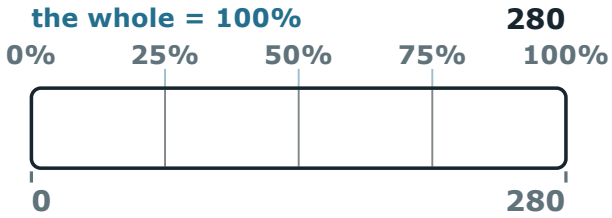
12,5% of R160 = R_____

b) Work out **1% of R1 500**, and then **3% of R1 500**.

Draw your model

R1 500 ÷ 100 = R_____, then × 3 = R_____

7 ★ What can you work out from this bar model? **Write 25%, 50% and 75% of 280 under the bar.**



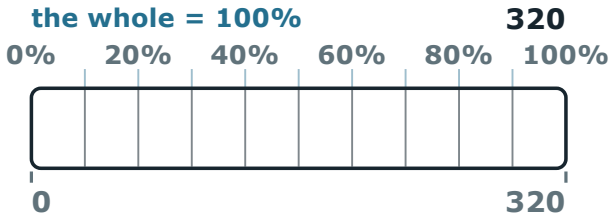
25% of 280 = _____

50% of 280 = _____

75% of 280 = _____

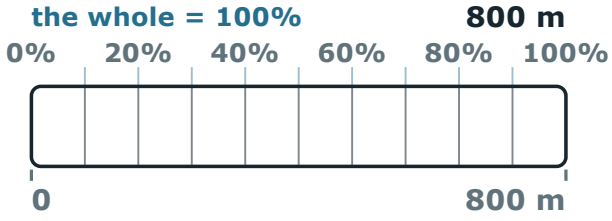
APPLICATION **At the banana stall** Use the model, then write your own number sentence.

8 ★★ Mam' Zanele unpacks a crate of **320 bananas** at her stall. **15%** of them are still green. **How many bananas are green?**



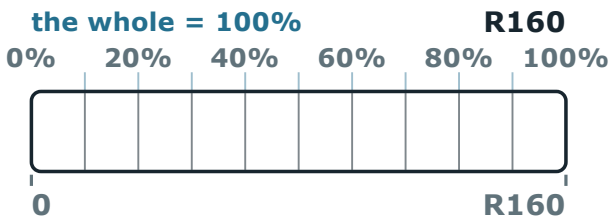
_____ = _____ bananas

9 ★★ From the taxi rank to the far end of the Umtamvuna bridge and back is a walk of **800 m**. After **30%** of the walk Max stops to look down at the river. **How far has he walked?**



_____ = _____ m

10 ★★ Max has **R160** for the day. He spends **20%** of it on bananas and a cold drink at the stall, and **5%** of it on a postcard of the bridge. **How much does he spend altogether?**

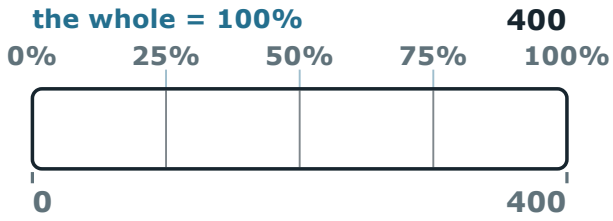


_____ = R_____

Percentages in your head

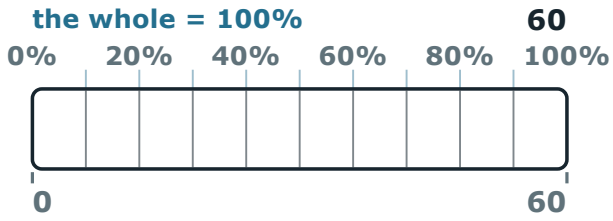
11 ★★ Max counts **400 cars** crossing the bridge, and **23%** of them stop at the stall. **About how many cars stop?** Use a friendly percentage close to 23%.

_____ = _____ cars



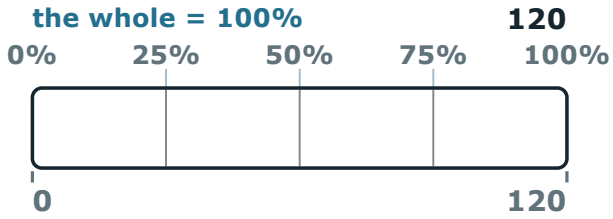
12 ★★ Along the fence above the empty beach Max counts **60 aloes**. **45%** of them are in flower. **How many aloes are in flower?** Use 50%, and take 5% off.

_____ = _____ aloes



13 ★★ Mam' Zanele hangs up **120 bunches** of bananas in the morning. By four o'clock **75%** of them are sold. **How many bunches are sold?**

_____ = _____ bunches



REASONING Convince Max

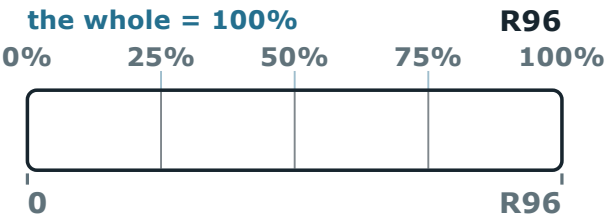
Decide, then explain how you know.

14 ★★★ **a)** Mam' Zanele says: "To find **25%** of an amount, I halve the amount, then halve it again." **Do you agree with her?** Explain your answer.

- ◯ Yes: half of a half is a quarter, and 25% is a quarter
- ◯ No: to find 25% you must divide by 25
- ◯ No: halving twice brings you back to the whole

Explain: _____

b) Try it her way: work out 25% of R96.



25% of R96 = half of R_____ = R_____

15 ★★★ **a)** Max says: "To find **20%** of an amount, I can find 10% and double it." **Do you agree with Max?** Explain your answer.

- ◯ Yes: 20% is two lots of 10%
- ◯ No: to find 20% you must divide by 20
- ◯ No: double 10% is 100%

Explain: _____

b) Try it Max's way: work out 20% of R45.

%	**100**	**10**	
rand	**R45**		

R45 ÷ 10 = R_____, then × 2 = R_____

Percentages in your head

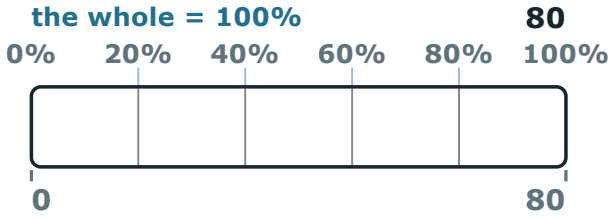
16 ★★★

a) Sipho says: "To find 10% I divide by 10, so to find **20%** I divide by 20." He writes 20% of 80 = 80 ÷ 20 = 4. **Explain the mistake Sipho has made.**

- ◯ 20% is a fifth of the whole, so he must divide by 5
- ◯ He should have divided by 2
- ◯ Nothing is wrong: 20% of 80 is 4

Explain: _____

b) So what is 20% of 80?



20% of 80 = _____

17 ★★★

a) 10% of 30,6 = 3,06 Is the statement true or false?

- ◯ True
- ◯ False

b) So what is 5% of 30,6?

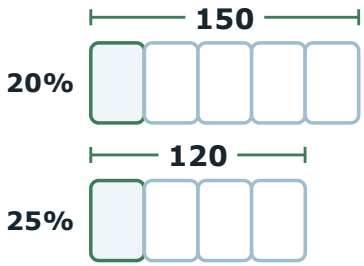
%	100	10	5
amount	30,6	3,06	

5% of 30,6 = _____

Explain: _____

18 ★★★

a) Here are two bar models. **Work out 20% of 150 and 25% of 120.**



_____ = _____

b) So compare 20% of 150 and 25% of 120. Write <, > or =.

20% of 150 _____ 25% of 120

Explain: _____

19 PROBLEM OF THE DAY **Turn the cups**

On the coast at Port Edward, Max finds five cups standing upside down in a row. In one turn Max must turn over exactly two cups, no more and no fewer.

Get every cup the right way up. If you are sure it cannot be done, say so, and be ready to say why. Write down which cups you turn each time.



Think further: What if there are six cups? For which numbers of cups can it be done, two at a time?

Explain one thing you learned.

I can do this: ◯ independently ◯ with help ◯ I need more practice