Reasoning and Problem Solving
Step 6: Percentages – Missing Values

National Curriculum Objectives:

Mathematics Year 6: (6R2) Solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison
Mathematics Year 6: (6F11) Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts

Differentiation:

Questions 1, 4 and 7 (Reasoning)
Developing Explain which statement is correct. Percentages are multiples of 10%.
Expected Explain which statement is correct. Percentages are multiples of 5% and 10%, with some multiples of 1%. Some answers include decimal places.
Greater Depth Explain which statement is correct. Includes any percentage, including multiples of 0.5%. Answers may include decimal places.

Questions 2, 5 and 8 (Problem Solving)
Developing Find 2 possible solutions to the missing values. Percentages are multiples of 10%.
Expected Find 2 possible solutions to the missing values. Percentages are multiples of 5% and 10%, with some multiples of 1%. Some answers include decimal places.
Greater Depth Find 2 possible solutions to the missing values. Includes any percentage, including multiples of 0.5%. Answers may include decimal places.

Questions 3, 6 and 9 (Problem Solving)
Developing Find 2 possible combinations of percentages to a word problem. Percentages are multiples of 10%.
Expected Solve a multi-step word problem by finding the missing values. Percentages are multiples of 5% and 10%, with some multiples of 1%. Some answers include decimal places.
Greater Depth Solve a multi-step word problem by finding the missing values. Includes any percentage, including multiples of 0.5%. Answers may include decimal places.

More Year 6 Percentages resources.

Did you like this resource? Don't forget to review it on our website.

Percentages – Missing Values

1a. The children disagree about how to find 20% of 60.

Olivia

I've found that 18 = 30%, so 20% must be 12.

I've found that 28 = 40%, so 20% must be 7.

Lucas

Who is correct? Explain why.

D R

1b. The children disagree about how to find 30% of 400.

Fionn

I've found that 80 = 20%, so 30% must be 240.

I've found that 240 = 60%, so 30% must be 120.

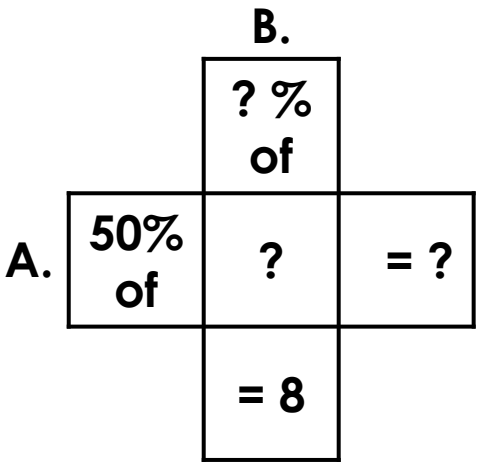
Abdol

Who is correct? Explain why.

D R

2a. What could the missing values be?

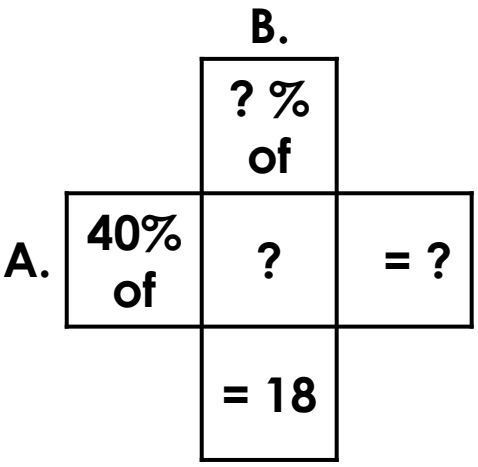
Find 2 possible solutions.



D PS

2b. What could the missing values be?

Find 2 possible solutions.



D PS

3a. There are 240 sweets in a jar.

20% of the sweets are orange; the rest are yellow and green.

The percentages of yellow and green sweets are multiples of 10.

Give 2 possible combinations of yellow and green sweets.

Write your answers as percentages and amounts.

D PS

3b. There are 300 cupcakes altogether at a bake sale.

30% of the cupcakes are red; the rest are lilac and pink.

The percentages of lilac and pink cupcakes are multiples of 10.

Give 2 possible combinations of lilac and pink cupcakes.

Write your answers as percentages and amounts.

D PS

Percentages – Missing Values

4a. The children disagree about how to find 35% of 500.

Leon

I've found that 150 = 30%, so 35% must be 155.

I've found that 50 = 10%, so 35% must be 175.

Marcus

Who is correct? Explain why.

E

R

4b. The children disagree about how to find 85% of 300.

Annie

I've found that 240 = 80%, so 30% must be 255.

I've found that 60 = 20%, so 85% must be 270.

Stephen

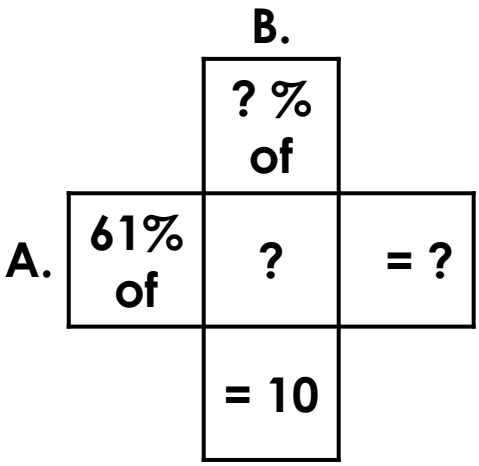
Who is correct? Explain why.

E

R

5a. What could the missing values be?

Find 2 possible solutions.

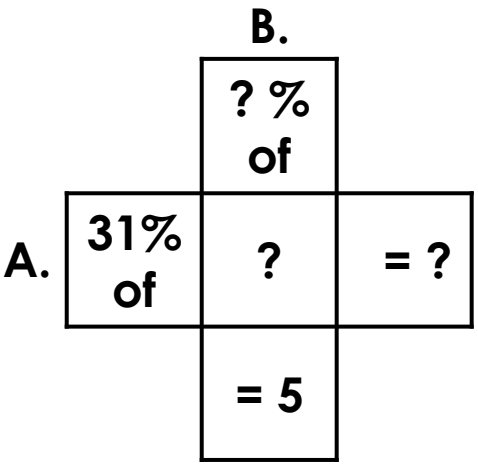


E

PS

5b. What could the missing values be?

Find 2 possible solutions.



E

PS

6a. A garden centre has a variety of plants; there are 200 plants altogether.

85% of the plants are roses.

60% of the roses are red, the rest are yellow.

How many red roses are there? How many yellow roses are there?

E

PS

6b. A pizzeria sells a variety of pizzas; There are 400 pizzas altogether.

65% of them are cheese pizzas.

35% of the cheese pizzas have stuffed crust, the rest do not.

How many cheese pizzas have stuffed crust? How many cheese pizzas do not?

E

PS

Percentages – Missing Values

7a. The children disagree about how to find 33% of 140.

Tia

I've found that 14 = 10%, so 33% must be 56.

I've found that 15.4 = 11%, so 33% must be 46.2.

Joe

Who is correct? Explain why.

GD

R

7b. The children disagree about how to find 87.5% of 300.

Leida

I've found that 37.5 = 12.5%, so 87.5% must be 262.5.

I've found that 15 = 5%, so 87.5% must be 255.

Donnie

Who is correct? Explain why.

GD

R

8a. What could the missing values be?

Find 2 possible solutions.

	B.		
	? % of		
A. 62.5 % of	?	= ?	
	= 12		

GD

PS

8b. What could the missing values be?

Find 2 possible solutions.

	B.		
	? % of		
A. 47.5 % of	?	= ?	
	= 5		

GD

PS

9a. A school have planned a trip for Year 7. There are 200 children in Year 7.

92% of the children are going.

75% of the children on the trip take part in an obstacle course; 50% of those children complete the course.

How many children went on the course?
How many completed it?
What percentage of children in Year 7 completed the obstacle course?

GD

PS

9b. A gardener has grown some plants. There are 250 plants altogether.

80% of the plants are edible.

37% of the edible plants are fruits; the rest are vegetables.

How many of the edible plants are fruits?
How many of the edible plants are vegetables?
What percentage of all the plants in his garden are vegetables?

GD

PS

Reasoning and Problem Solving
Percentages – Missing Values

Developing

1a. Olivia is correct. Lucas has made a mistake in his calculation; 40% of 60 is 24, not 28.

2a. Various answers, for example:
A. 50% of 40 = 20, B. 20% of 40 = 8; A. 50% of 80 = 40, B. 10% of 80 = 8.

3a. Various answers, for example:
48 orange sweets (20%), 96 yellow sweets (40%), 96 green sweets (40%); 48 orange sweets (20%), 144 yellow sweets (60%), 48 green sweets (20%).

Expected

4a. Marcus is correct. Although Leon has worked out 30% of 500 correctly, he has incorrectly added 5 to work out 35% instead of adding 5%.

5a. Various answers, for example:
A. 61% of 100 = 61, B. 10% of 100 = 10; A. 61% of 50 = 30.5, B. 20% of 50 = 10.

6a. 85% of 200 = 170 roses in total. 102 are red roses (60% of 170), 68 are yellow roses (40% of 170).

Greater Depth

7a. Joe is correct. Although Tia has worked out 10% of 140 correctly, she has incorrectly multiplied it by 4, which would give her 40%, not 33%.

8a. Various answers, for example:
A. 62.5% of 120 = 75, B. 10% of 120 = 12; A. 62.5% of 240 = 150, B. 5% of 240 = 12.

9a. 92% of 200 = 184 children in total. 138 children take part in the obstacle course (75% of 184), 69 children completed the course (50% of 138). 34.5% of the children in Year 7 completed the obstacle course.

Reasoning and Problem Solving
Percentages – Missing Values

Developing

1b. Abdol is correct. Although Fionn has worked out 20% of 400 correctly, he has incorrectly multiplied it by 3, which would give him 60%, not 30%.

2b. Various answers, for example:
A. 40% of 90 = 36, B. 20% of 90 = 18; A. 40% of 180 = 72, B. 10% of 180 = 18.

3b. Various answers, for example:
90 red cupcakes (30%), 90 lilac cupcakes (30%), 120 pink cupcakes (40%); 90 red cupcakes (30%), 150 lilac cupcakes (50%), 60 pink cupcakes (20%).

Expected

4b. Annie is correct. Although Stephen has worked out 20% of 300 correctly, he has used this fact to help him work out 90%, not 85% of 300.

5b. Various answers, for example:
A. 31% of 50 = 15.5, B. 10% of 50 = 5; A. 31% of 100 = 31, B. 5% of 100 = 5.

6b. 65% of 400 = 260 cheese pizzas in total. 91 are cheese pizzas with stuffed crust (35% of 260), 169 are pizzas without stuffed crust (65% of 260).

Greater Depth

7b. Leida is correct. Although Donnie has worked out 5% of 300 correctly, he has used this fact to help him work out 85% of 300, not 87.5%.

8b. Various answers, for example:
A. 47.5% of 50 = 23.75, B. 10% of 50 = 5; A. 47.5% of 100 = 47.5, B. 5% of 100 = 5.

9b. 80% of 250 = 200 edible plants in total. 74 are fruits (37% of 200), 126 are vegetables (63% of 200). 50.4% of the plants in his garden are vegetables.