

## Week 8

### This week in a nutshell:

Here we see topics that require use of definitions (congruence/similarity) so be sure to promote mathematical literacy for this. Confidence with “special numbers” should be encouraged as recognising these can be very helpful in exam situations.

You may wish to discuss how simple interest relates to work done so far on proportion. Allow questions to be asked when dealing with probability, especially if students are unfamiliar with certain contexts.

**Question 1:** Basic probability

**Question 2:** Simple interest

**Question 3:** Square, triangular, cube numbers

**Question 4:** Congruence and similarity

**Question 5:** Circle area

### This week's ideas for class discussion include:

Question 1: **Basic probability**

- What must all probabilities sum to? Can you explain why this is the case?
- How does listing outcomes help when calculating probability?

Question 2: **Simple interest**

- Most bank accounts do not use simple interest; why do you think this is the case?

Question 3: **Square, triangular, cube numbers**

- How do you think these numbers relate to ideas from geometry?

Question 4: **Congruence and similarity**

- Why is it not always possible to tell “by eye” whether objects are similar or congruent?
- How far do you agree that congruence could be considered a special case of similarity?

Question 5: **Circle area**

- Is there a way to check if your answer seems reasonable? What approximations could you use?

## Week 8: Day 1

1) With one throw of a 6-sided die, what's the probability of throwing a 3?

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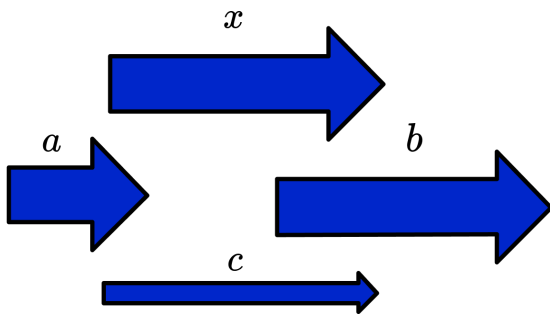
2) £200 is deposited in a bank account paying 3% simple interest per annum. How much interest will have been paid after 2 years?

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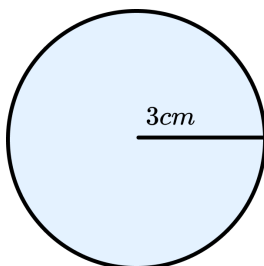
3) Write down the first ten square numbers.

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4) Which shape is congruent to  $x$ ?



5) Calculate the area of this circle:



## Week 8: Day 1 Answers

- 1) With one throw of a 6-sided die, what's the probability of throwing a 3?

$\frac{1}{6}$

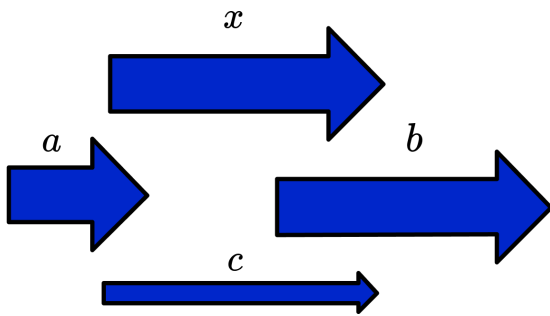
- 2) £200 is deposited in a bank account paying 3% simple interest per annum. How much interest will have been paid after 2 years?

£12

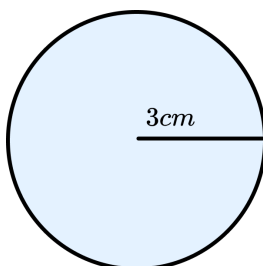
- 3) Write down the first ten square numbers.

1, 4, 9, 16, 25, 36, 49, 64, 81, 100

- 4) Which shape is congruent to  $x$ ?  $b$



- 5) Calculate the area of this circle:  $28.27\text{cm}^2$  (2dp)



## Week 8: Day 2

- 1) The probability that Tilly forgets her homework is 0.3; what is the probability she remembers her homework?

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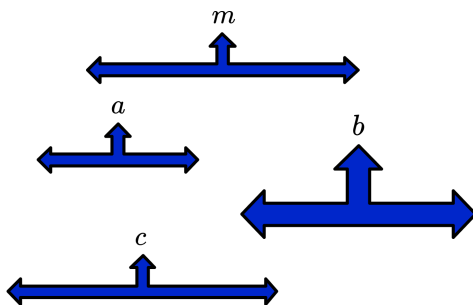
- 2) £800 is deposited in a bank account paying 2% simple interest per annum.  
How much interest will have been paid after 4 years?

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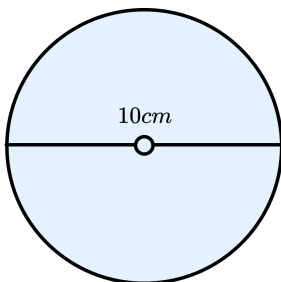
- 3) Write down the first five cube numbers.

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- 4) Which shape is congruent to  $m$ ?



- 5) Calculate the area of this circle:



## Week 8: Day 2 Answers

- 1) The probability that Tilly forgets her homework is 0.3; what is the probability she remembers her homework?

0.7

- 2) £800 is deposited in a bank account paying 2% simple interest per annum.

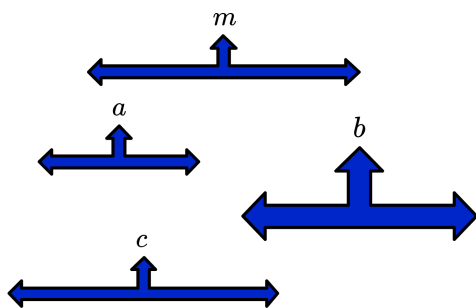
How much interest will have been paid after 4 years?

£64

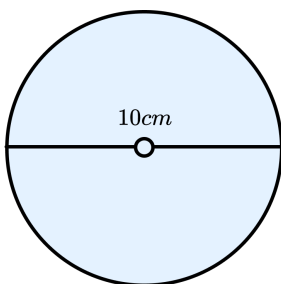
- 3) Write down the first five cube numbers.

1, 8, 27, 64, 125

- 4) Which shape is congruent to  $m$ ?  $C$



- 5) Calculate the area of this circle:  $78.54\text{cm}^2$  (2dp)



## Week 8: Day 3

1) With one throw of a 6-sided die, what's the probability of throwing a 7?

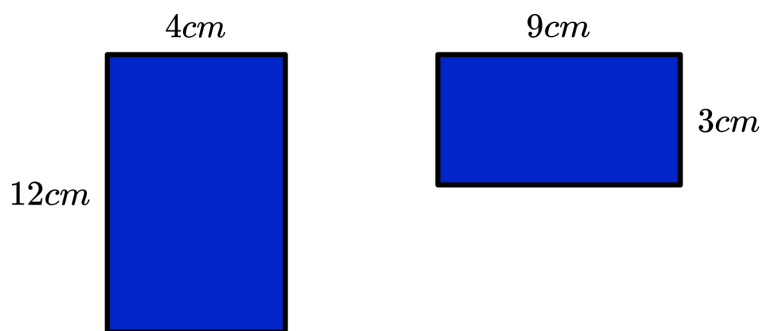
2) £250 is deposited in a bank account paying 5% simple interest per annum.

How much interest will have been paid after 5 years?

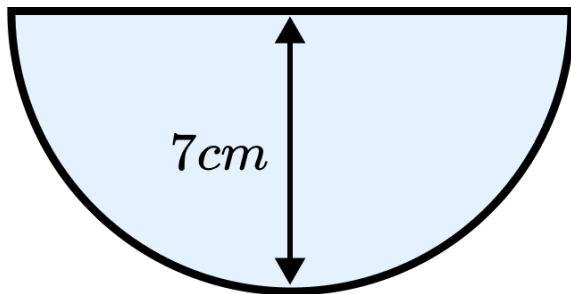
3) Continue this sequence:

1, 3, 6, 10, 15, ... , ...

4) Are these rectangles congruent, similar or neither?



5) Calculate the area of this semicircle:



## Week 8: Day 3 Answers

- 1) With one throw of a 6-sided die, what's the probability of throwing a 7?

0

- 2) £250 is deposited in a bank account paying 5% simple interest per annum.

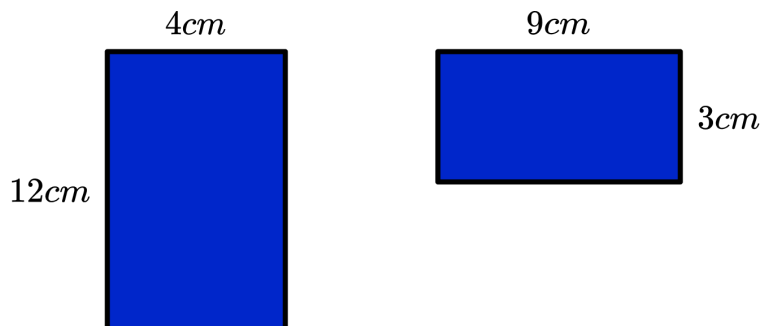
How much interest will have been paid after 5 years?

£62.50

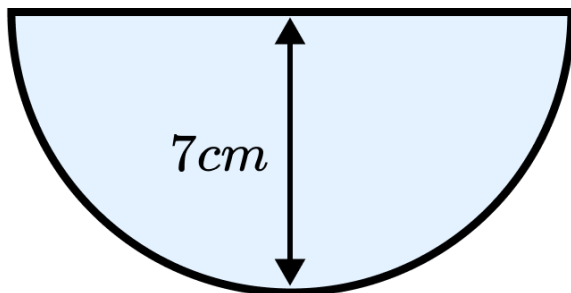
- 3) Continue this sequence:

1, 3, 6, 10, 15, 21, 28

- 4) Are these rectangles congruent, similar or neither? Similar



- 5) Calculate the area of this semicircle:  $76.97\text{cm}^2$  (2dp)



## Week 8: Day 4

- 2) £7500 is deposited in a bank account paying 1.5% simple interest per annum.  
How much interest will have been paid after 2 years?

b)  $3^2 + 4^2 + 2^3$

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- A diagram of a quarter-circle sector. The two straight radii are labeled '9cm'. The sector is shaded light blue.



## Week 8: Day 4 Answers

- 1) What is the probability of drawing a picture card from a standard deck of playing cards?

**12/52 or 3/13**

- 2) £7500 is deposited in a bank account paying 1.5% simple interest per annum.

How much interest will have been paid after 2 years?

**£225**

3) a)  $3^3 - 2^2$

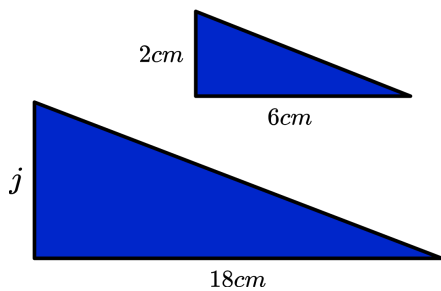
**23**

b)  $3^2 + 4^2 + 2^3$

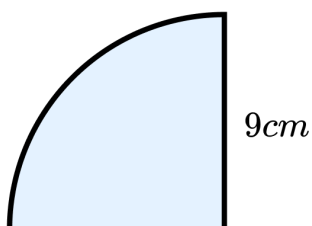
**33**

- 4) These triangles are similar.

Calculate the length of  $j$ . **6cm**



- 5) Calculate the area of this quarter circle:  **$63.62\text{cm}^2$  (2dp)**



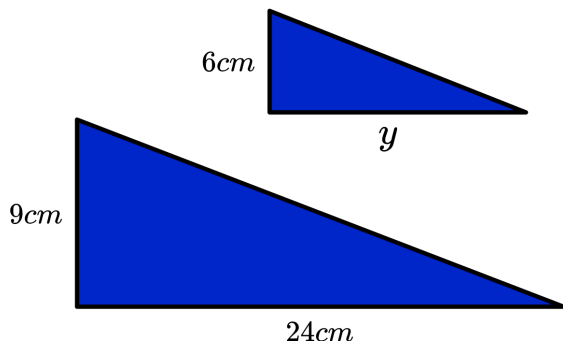
## Week 8: Day 5

- 1) Bobi tosses a 50p coin twice. What's the probability that he will get two heads?

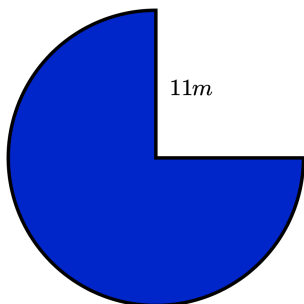
- 2) £1500 is deposited in a bank account paying 2.5% simple interest per annum.  
How much money is in the account after 8 years?

- 3) " $x^3$  is bigger than  $x^2$ "  
Is this true sometimes, always, or never?

- 4) These triangles are similar. Calculate the length of  $y$ .



- 5) Calculate the area of this circle, which has had one quarter removed:



## Week 8: Day 5 Answers

- 1) Bobi tosses a 50p coin twice. What's the probability that he will get two heads?

$\frac{1}{4}$

- 2) £1500 is deposited in a bank account paying 2.5% simple interest per annum.

How much money is in the account after 8 years?

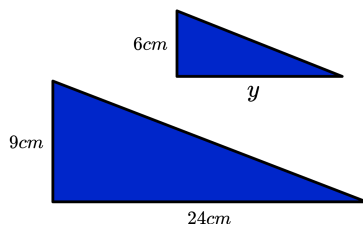
£1800

- 3) “ $x^3$  is bigger than  $x^2$ ”

Is this true sometimes, always, or never?

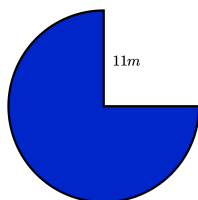
Sometimes

- 4) These triangles are similar. Calculate the length of  $y$ . 16cm



- 5) Calculate the area of this circle, which has had one quarter removed:

$285.10\text{cm}^2$  (2dp)



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