

Week 12

This week in a nutshell:

Question 1 is a reminder of some measures in circles. Questions 2-4 focus on skills that form part of a mathematical toolkit. For question 2, remind students that an equation solving method is appropriate for these tasks. Question 5 considers the probability of combined events; these are not unduly overcomplicated.

Question 1: Measures in circles

Question 2: Changing the subject

Question 3: Generating sequences

Question 4: Symmetry

Question 5: Probability (combined events)

The questions aim to develop and deepen understanding over the week. Due to the necessity of the topics covered this week, there is an emphasis on the interchangeability of command words, and language flexibility. It may be worth taking some extra time this week to make sure your students are developing their mathematical literacy.

This week's ideas for class discussion include:

Question 1: **Measures in circles**

- How do you remember the formulae for circles?

Question 2: **Changing the subject**

- Is changing the subject just generalised equation solving?

Question 3: **Generating sequences**

- Can two different rules generate the same sequence?

Question 4: **Symmetry**

- When does the order of rotational symmetry equal the number of lines of symmetry? Why?

Question 5: **Probability (combined events)**

- Does combining the probabilities for events change the reliability of our answer?

Week 12: Day 1

- 1) What is the area of a circle with radius 11cm?

- 2) Make f the subject:

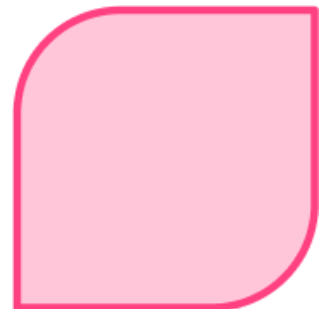
$$2p = f - 2e$$

- 3) Generate the first 5 terms of the sequence with n^{th} term rule,

$$3n - 1$$

- 4) For the shape below:

- a) State the order of rotational symmetry
- b) Draw any/all lines of reflectional symmetry



- 5) Two unbiased coins are tossed at the same time.

What is the probability of both coins landing heads up?

Week 12: Day 1 Answers

- 1) What is the area of a circle with radius 11cm?

$$380.13\text{cm}^2 \text{ (2dp)}$$

- 2) Make f the subject:

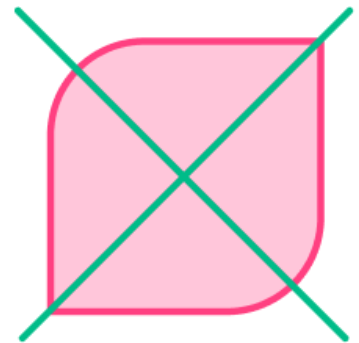
$$2p = f - 2e$$
$$f = 2p + 2e$$

- 3) Generate the first 5 terms of the sequence with n^{th} term rule,

$$3n - 1 \quad 2, 5, 8, 11, 14$$

- 4) For the shape below:

- a) State the order of rotational symmetry **2**
b) Draw any/all lines of reflectional symmetry



- 5) Two unbiased coins are tossed at the same time.

What is the probability of both coins landing heads up?

$$\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$$

Week 12: Day 2

- 1) What is the circumference of a circle with diameter 8cm?

- 2) Make g the subject:

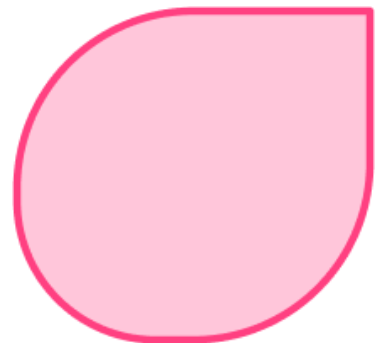
$$3 = 7h - g$$

- 3) Generate the first 5 terms of the sequence with n^{th} term rule,

$$2n + 3$$

- 4) For the shape below:

- a) State the order of rotational symmetry
- b) Draw any/all lines of reflectional symmetry



- 5) A bag contains 2 red counters and 3 blue counters. A counter is drawn from the bag at random, the colour recorded and the counter replaced. Then another counter is drawn.

What is the probability that both counters are red?

Week 12: Day 2 Answers

- 1) What is the circumference of a circle with diameter 8cm?

25.13cm (2dp)

- 2) Make g the subject:

$$3 = 7h - g$$

$$g = 7h - 3$$

- 3) Generate the first 5 terms of the sequence with n^{th} term rule,

$$2n + 3$$

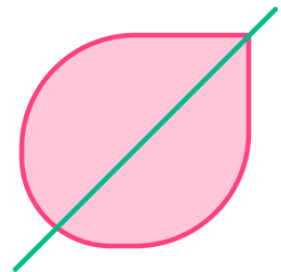
5, 7, 9, 11, 13

- 4) For the shape below:

- a) State the order of rotational symmetry

No rotational symmetry

- b) Draw any/all lines of reflectional symmetry



- 5) A bag contains 2 red counters and 3 blue counters. A counter is drawn from the bag at random, the colour recorded and the counter replaced. Then another counter is drawn.

What is the probability that both counters are red?

$$\frac{2}{5} \times \frac{2}{5} = \frac{4}{25}$$

- 1) What is the area of a circle with diameter 20cm?
-

- 2) Make b the subject:

$$a = 4c - 2b$$

- 3) Generate the first 5 terms of the sequence with n^{th} term rule,

$$19 - 3n$$

- 4) For the isosceles trapezium below:
- a) State the order of rotational symmetry
 - b) Draw any/all lines of reflectional symmetry



- 5) Three unbiased coins are tossed at the same time.

What is the probability of all three coins landing tails up?

Week 12: Day 3 Answers

- 1) What is the area of a circle with diameter 20cm?

$$314.16\text{cm}^2 \text{ (2dp)}$$

- 2) Make b the subject:

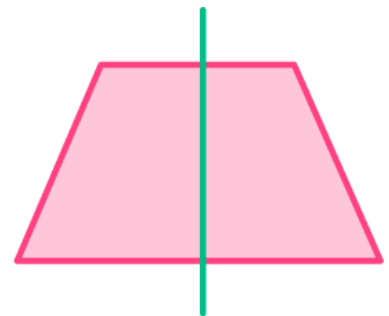
$$a = 4c - 2b$$

$$b = \frac{1}{2}(4c - a)$$

- 3) Generate the first 5 terms of the sequence with n^{th} term rule,

$$19 - 3n \quad 16, 13, 10, 7, 4$$

- 4) For the isosceles trapezium below:
- State the order of rotational symmetry
No rotational symmetry
 - Draw any/all lines of reflectional symmetry



- 5) Three unbiased coins are tossed at the same time.

What is the probability of all three coins landing tails up?

$$\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = \frac{1}{8}$$

Week 12: Day 4

- 1) What is the area of a circle with a diameter of 17cm?

- 2) Make m the subject:

$$2(m - 4) = 4m - 10$$

- 3) Generate the first 5 terms of the sequence with n^{th} term rule,

$$9n - 7$$

- 4) For the shape below:

- a) State the order of rotational symmetry
- b) Draw any/all lines of reflectional symmetry



- 5) A bag contains 3 red counters and 7 blue counters. A counter is drawn from the bag at random, the colour recorded and the counter replaced. Then another counter is drawn.

What is the probability that the first counter is red and the second counter is blue?

Week 12: Day 4 Answers

- 1) What is the area of a circle with a diameter of 17cm?

$$226.98\text{cm}^2 \text{ (2dp)}$$

- 2) Make m the subject:

$$2(m - 4) = 4n - 10$$

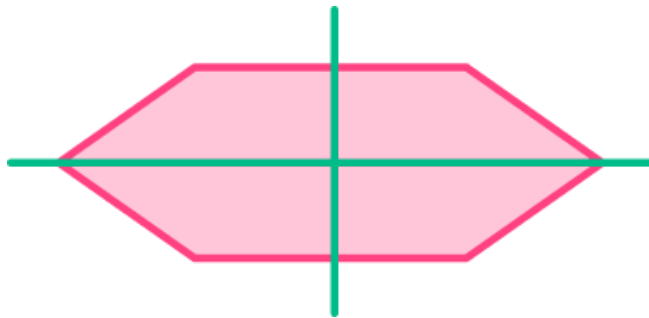
$$m = 2n - 1$$

- 3) Generate the first 5 terms of the sequence with n^{th} term rule,

$$9n - 7 \quad 2, 11, 20, 29, 38$$

- 4) For the shape below:

- State the order of rotational symmetry 2
- Draw any/all lines of reflectional symmetry



- 5) A bag contains 3 red counters and 7 blue counters. A counter is drawn from the bag at random, the colour recorded and the counter replaced. Then another counter is drawn.

What is the probability that the first counter is red and the second counter is blue?

$$\frac{3}{10} \times \frac{7}{10} = \frac{21}{100}$$

Week 12: Day 5

- 1) What is the circumference of a circle with radius 7.5cm?

- 2) Make y the subject:

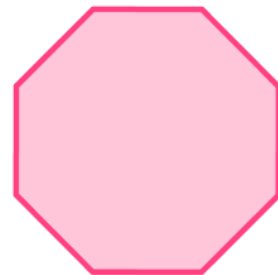
$$2z - 3y = x - 2y$$

- 3) Generate the first 5 terms of the sequence with n^{th} term rule,

$$100 - n^2$$

- 4) For the regular octagon below:

- a) State the order of rotational symmetry
- b) Draw all lines of reflectional symmetry



- 5) A fair coin is flipped and an unbiased 6-sided dice is rolled, with the result recorded.

Find the probability that the coin shows heads AND the dice displays an odd number.

Week 12: Day 5 Answers

- 1) What is the circumference of a circle with radius 7.5cm?

47.12cm

- 2) Make y the subject:

$$2z - 3y = x - 2y$$

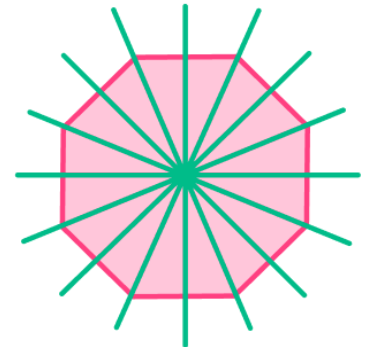
$$y = 2z - x$$

- 3) Generate the first 5 terms of the sequence with n^{th} term rule,

$$100 - n^2 \quad 99, 96, 91, 84, 75$$

- 4) For the regular octagon below:

- a) State the order of rotational symmetry 8
b) Draw all lines of reflectional symmetry



- 5) A fair coin is flipped and an unbiased 6-sided dice is rolled, with the result recorded.
Find the probability that the coin shows heads AND the dice displays an odd number.

$$\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$$

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