

Week 5

This week in a nutshell:

This week, it is likely that students will require extra time to read the questions; there is slightly more language processing of mathematical text to get through (this is intentional as the end of year approaches). Encourage your students to use effective strategies for decoding the questions, and possibly keep a record of words that need to be revisited.

Question 1: Derive an equation

Question 2: Probability of events

Question 3: Special sequences

Question 4: Histograms with equal class widths

Question 5: Loci

This week's ideas for class discussion include:

Question 1: **Derive an equation**

- Why does forming an equation make a problem easier to solve?
- How does algebraic language compare to language used in computer programming?

Question 2: **Probability of dependent events**

- How can we check that all probabilities from dependent events have been accounted for?

Question 3: **Special sequences**

- Can you think of any special sequences that we could derive a mathematical rule for?

Question 4: **Histograms with equal class widths)**

- When might the class widths of a histogram not be equal? How would this affect the diagram?

Question 5: **Loci**

- How would you describe a locus of points to a non-mathematician?

Week 5: Day 1

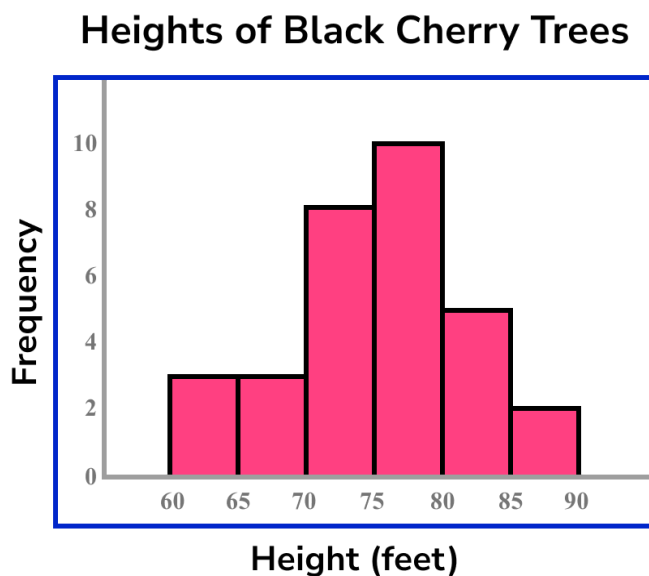
- 1) A rectangle's perimeter is 64cm. Its width is x and its length is $3x$. Determine the width of the rectangle.

- 2) A card is drawn from a well shuffled deck. What is the probability of choosing a red card or a picture card?

- 3) Find the next two terms in the sequence:

1, 10, 100, 1000, ... , ...

- 4) How many cherry trees are between 75 and 80 feet tall?

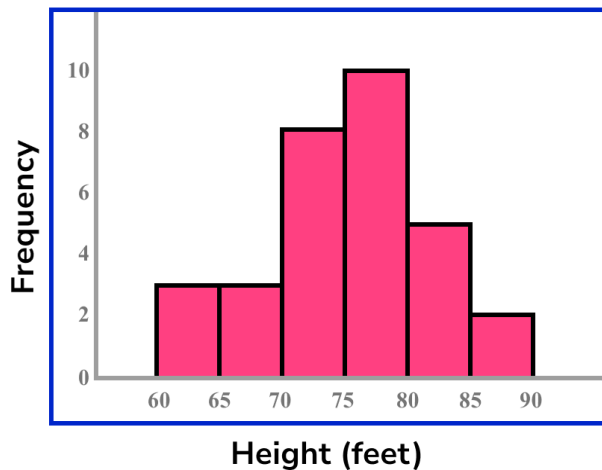


- 5) What does it mean if two lines are perpendicular to each other?

Week 5: Day 1 Answers

- 1) A rectangle's perimeter is 64cm. Its width is x and its length is $3x$.
Determine the width of the rectangle. **8cm**
-
- 2) A card is drawn from a well shuffled deck. What is the probability of choosing a red card or a picture card? $\frac{32}{52}$ **or** $\frac{8}{13}$
-
- 3) Find the next two terms in the sequence:
1, 10, 100, 1000, 10000, 100000
-
- 4) How many cherry trees are between 75 and 80 feet tall? **10**

Heights of Black Cherry Trees



- 5) What does it mean if two lines are perpendicular to each other?
They are at right-angles to each other/ they are at 90° to each other

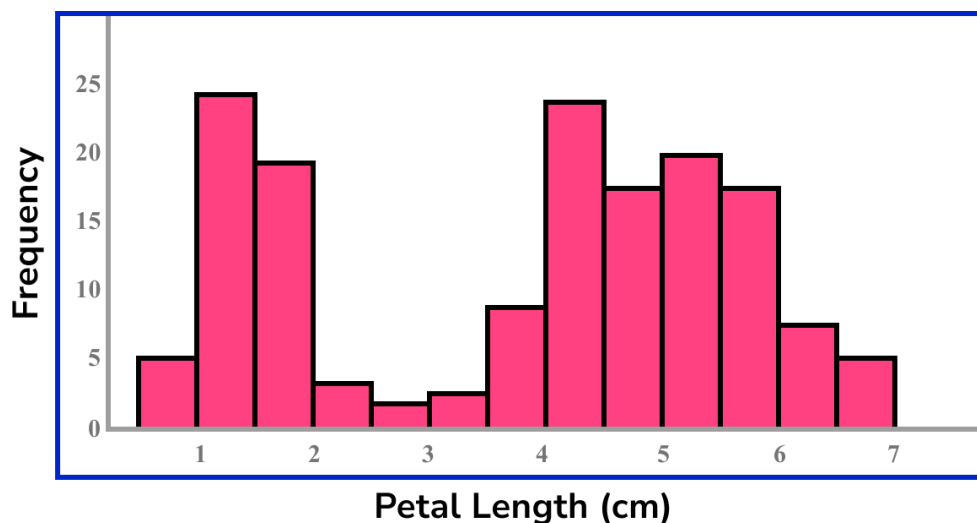
Week 5: Day 2

- 1) A square has area 81cm^2 . If the side length is $3y$, what is the value of y ?

- 2) There are 7 black marbles and 3 red marbles in a bag. Two marbles are picked without replacement. What is the probability that both marbles will be black?

- 3) Find the next two terms in the sequence:
1, 4, 9, 16, 25, ... , ...

- 4) How many petals were between 1cm and 2cm in length?



- 5) What does it mean to bisect an angle or a line segment?

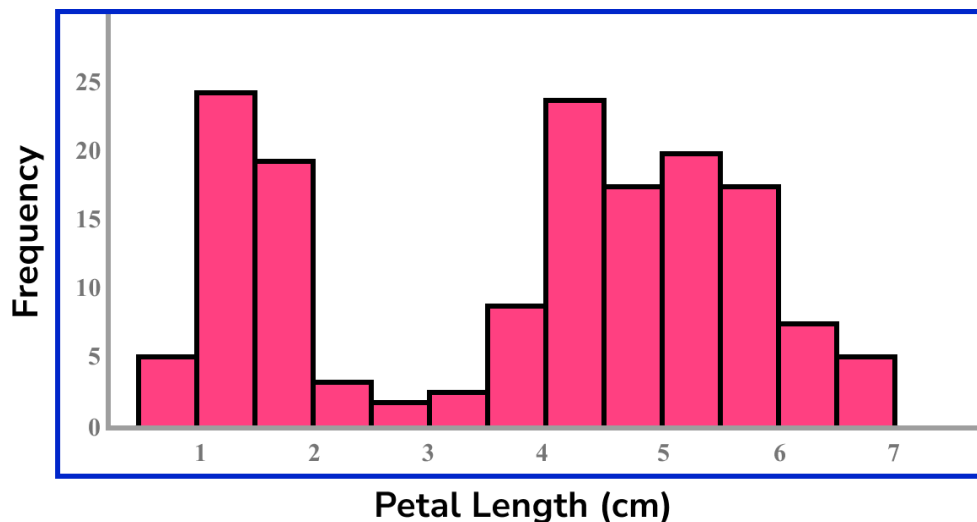
Week 5: Day 2 Answers

- 1) A square has area 81cm^2 . If the side length is $3y$, what is the value of y ?
3cm

- 2) There are 7 black marbles and 3 red marbles in a bag. Two marbles are picked without replacement. What is the probability that both marbles will be black? $\frac{42}{90}$ **or** $\frac{7}{15}$

- 3) Find the next two terms in the sequence:
1, 4, 9, 16, 25, **36, 49**

- 4) How many petals were between 1cm and 2cm in length? **43**



- 5) What does it mean to bisect an angle or a line segment?
Divide/cut it in half (or two equal parts)

Week 5: Day 3

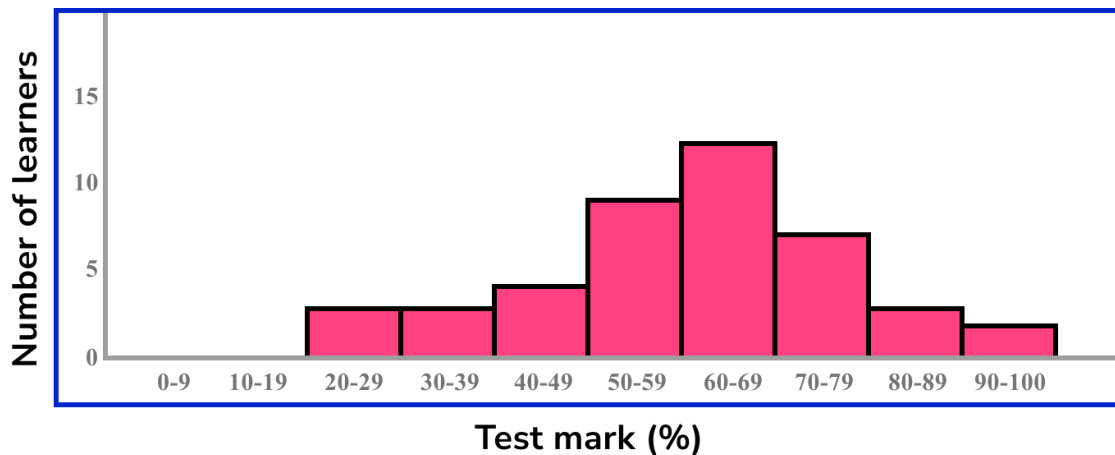
- 1) A rectangle's perimeter is 34cm. Its width is $2x$ and its length is $x+8$. Determine the length of the rectangle

- 2) You toss a coin two times. What is the probability that you get exactly one head?

- 3) Find the next two terms in the sequence:

 $1, 8, 27, 64, \dots, \dots$

- 4) How many learners scored less than 40%?



- 5) What shape would be the result of drawing the locus of points equidistant from a given point?

Week 5: Day 3 Answers

- 1) A rectangle's perimeter is 34cm. Its width is $2x$ and its length is $x+8$.

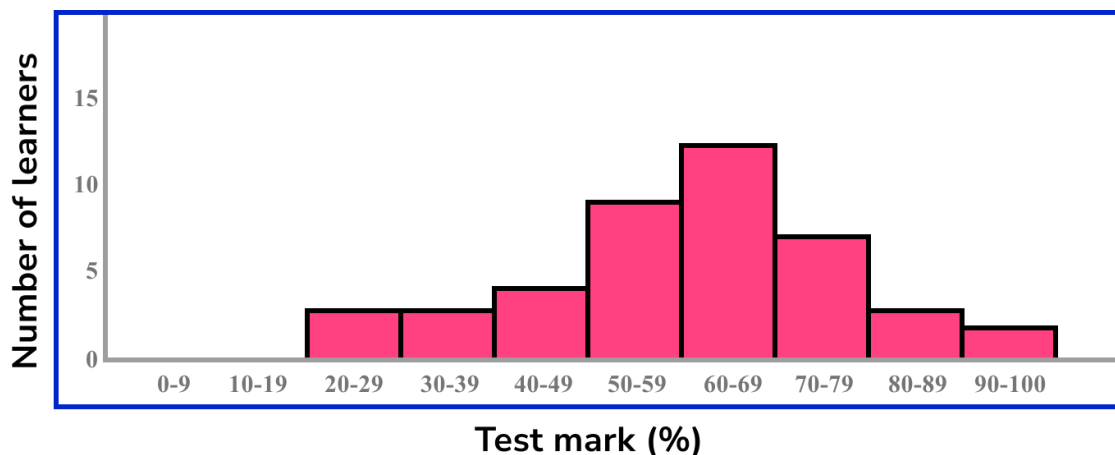
Determine the length of the rectangle **11cm**

- 2) You toss a coin two times. What is the probability that you get exactly one head? $\frac{1}{2}$

- 3) Find the next two terms in the sequence:

1, 8, 27, 64, **125, 216**

- 4) How many learners scored less than 40%? **4**



- 5) What shape would be the result of drawing the locus of points equidistant from a given point?

Circle

Week 5: Day 4

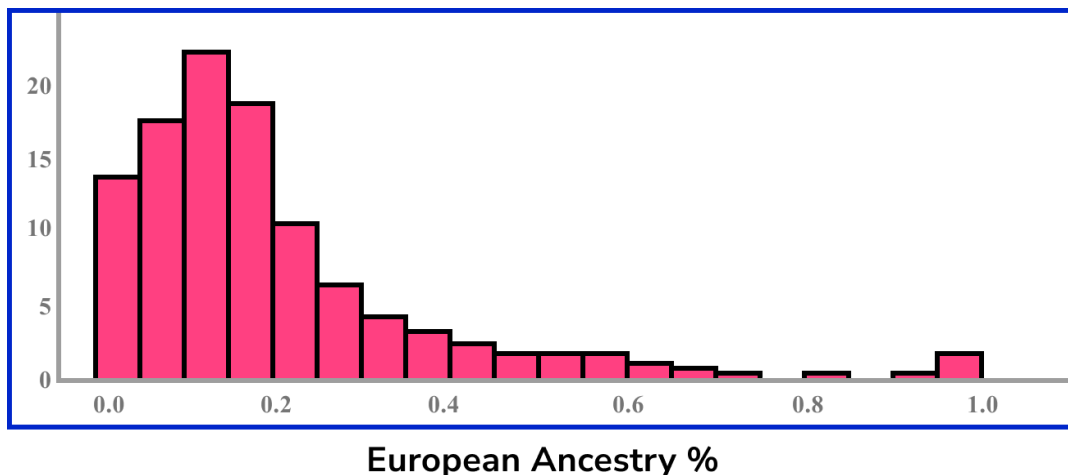
- 1) I think of a number, multiply it by 4, then subtract 7. The answer is 13.
Form and solve an equation to work out the number I was thinking of

- 2) You toss a coin 3 times. What is the probability that you get at least one head?

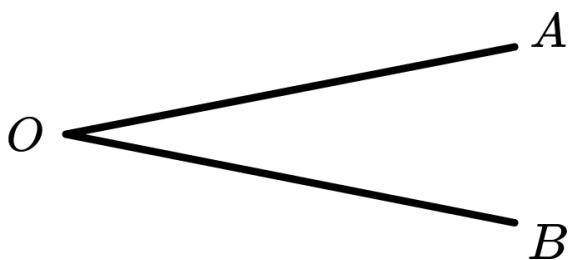
- 3) Find the next two terms in the sequence:

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

- 4) How many respondents had less than 0.2% European ancestry?

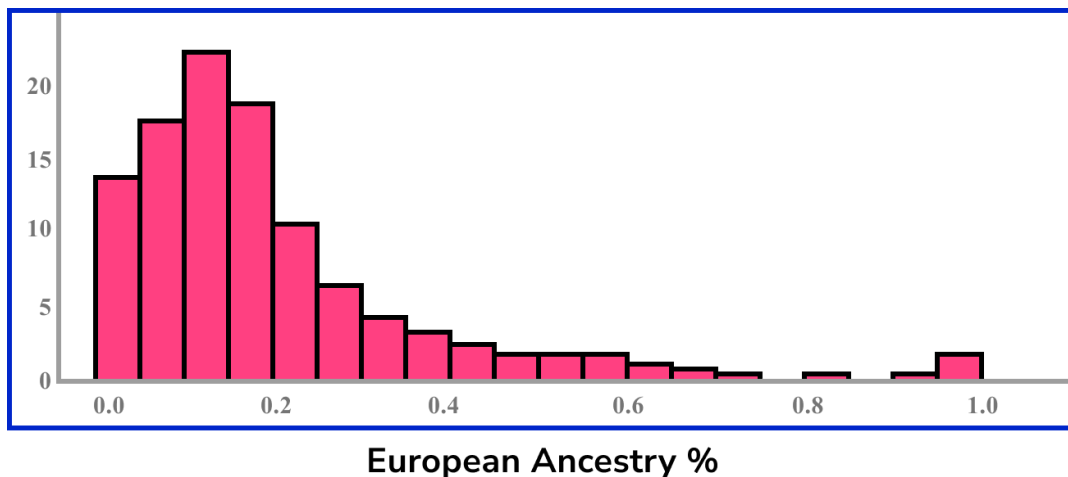


- 5) Which type of construction would be used to show the locus of points nearer to OA than OB?

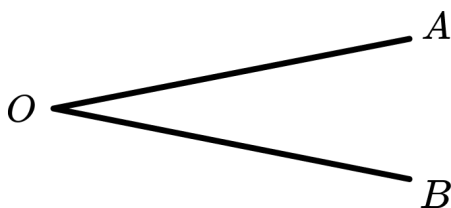


Week 5: Day 4 Answers

- 1) I think of a number, multiply it by 4, then subtract 7. The answer is 13.
Form and solve an equation to work out the number I was thinking of
 $4x - 7 = 13$, $x = 5$
- 2) You toss a coin 3 times. What is the probability that you get at least one head? $\frac{7}{8}$
- 3) Find the next two terms in the sequence:
1, 3, 6, 10, 15, **21**, **28**
- 4) How many respondents had less than 0.2% European ancestry? **70**



- 5) Which type of construction would be used to show the locus of points nearer to OA than OB? **Angle bisector**



Week 5: Day 5

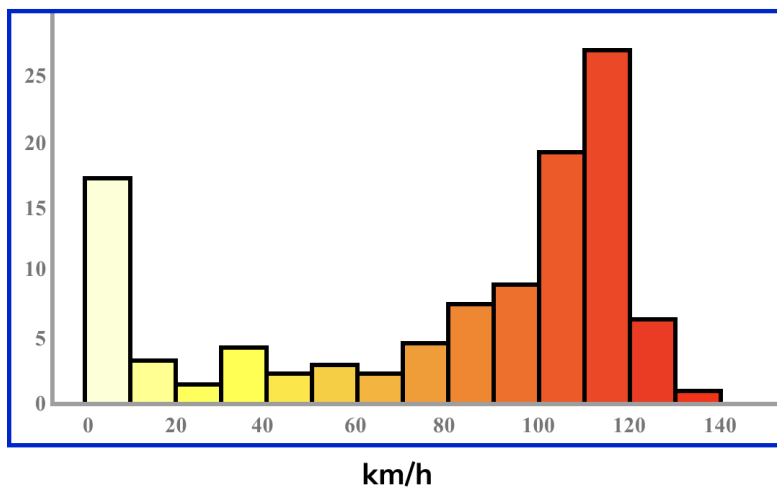
- 1) The angles of a triangle are $4x$, $(75 - x)$ and $(2x + 30)$. What type of triangle is this?

- 2) Two fair six-sided dice are rolled once. What is the probability that the sum of the dice equals 8?

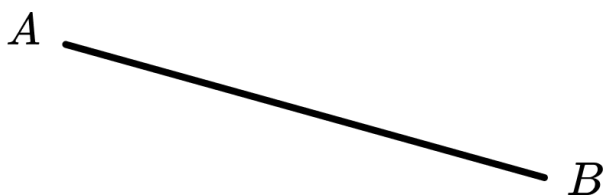
- 3) Find the next two terms in the sequence:
 $1, 1, 2, 3, 5, 8, 13, \dots, \dots$

- 4) How many cars drove to Köln at over 100km/h?

Speed distribution to Köln

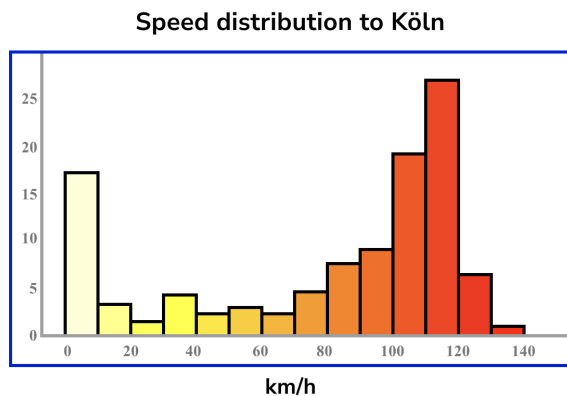


- 5) Which type of construction would be used to show the locus of points nearer to A than B?

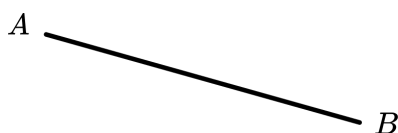


Week 5: Day 5 Answers

- 1) The angles of a triangle are $4x$, $(75 - x)$ and $(2x + 30)$. What type of triangle is this? **Equilateral**
- 2) Two fair six-sided dice are rolled once. What is the probability that the sum of the dice equals 8? $\frac{5}{36}$
- 3) Find the next two terms in the sequence:
1, 1, 2, 3, 5, 8, 13, 21, 34
- 4) How many cars drove to Köln at over 100km/h? **51**



- 5) Which type of construction would be used to show the locus of points nearer to A than B? **Perpendicular bisector**



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