Frequency polygons

Grade 4 | Worked solutions

GCSE Statistics topic practice

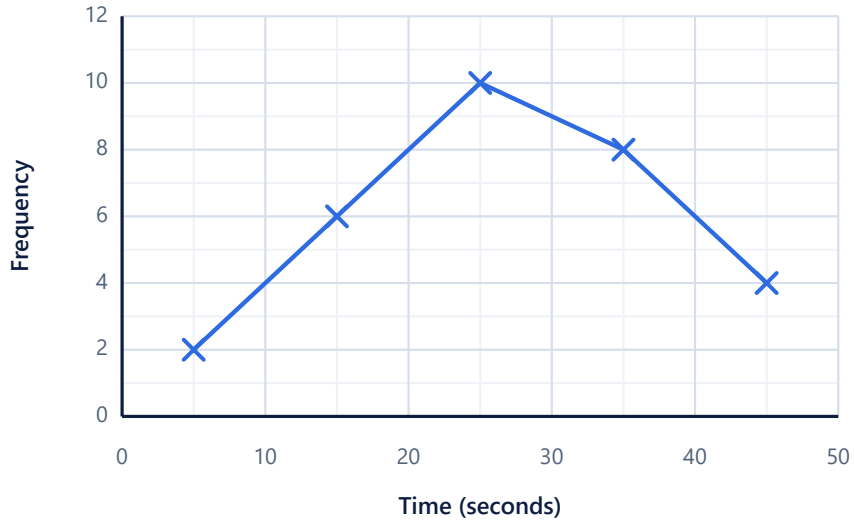
1 30 students each solved a puzzle. The frequency polygon shows information about the times, t seconds, they took.

The classes are $0 < t \leq 10$, $10 < t \leq 20$ and so on. Each point is plotted at the midpoint of its class.

a. Write down the modal class. (1)

b. How many students took 20 seconds or less? (1)

c. Work out the fraction of the students who took more than 30 seconds. (1)



(3 marks)

a)

The highest point is at 25 seconds.

The modal class is $20 < t \leq 30$

b)

$2 + 6 = 8$

8 students took 20 seconds or less.

c)

$8 + 4 = 12$

$\frac{12}{30} = \frac{2}{5}$

a) $20 < t \leq 30$ b) 8 c) $\frac{2}{5}$

Free for classroom and home use: print, photocopy and share. Not for resale or re-hosting.

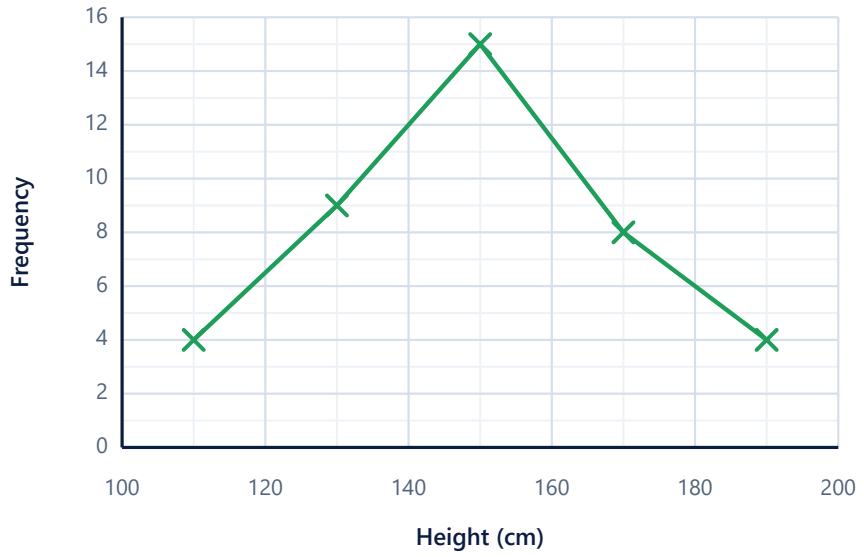
2 A gardener measures the height, h cm, of each of 40 sunflowers.

Height, h (cm)	Frequency
$100 < h \leq 120$	4
$120 < h \leq 140$	9
$140 < h \leq 160$	15
$160 < h \leq 180$	8
$180 < h \leq 200$	4

a. On the grid, draw a frequency polygon for this information. (2)

b. Write down the modal class. (1)

c. Work out the percentage of the sunflowers that are more than 160 cm tall. (1)



(4 marks)

a)

Plot each frequency at the midpoint of its class.

(110, 4) (130, 9) (150, 15) (170, 8) (190, 4)

Join the points with straight lines.

b)

Highest frequency is 15, so it is $140 < h \leq 160$

c)

$$8 + 4 = 12$$

$$\frac{12}{40} \times 100 = 30\%$$

a) polygon drawn b) $140 < h \leq 160$ c) 30%

Free for classroom and home use: print, photocopy and share. Not for resale or re-hosting.

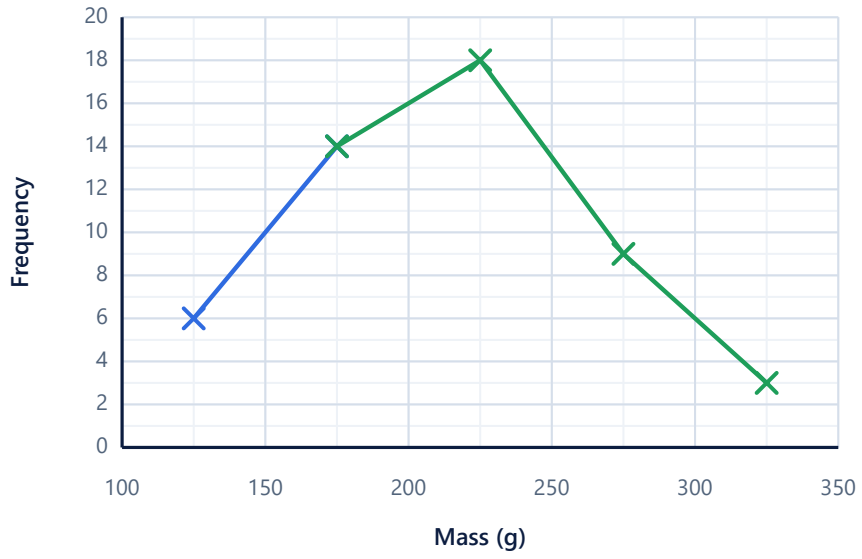
3 A farmer weighs 50 potatoes. The table shows information about the mass, m grams, of each potato.

Mass, m (g)	Frequency
$100 < m \leq 150$	6
$150 < m \leq 200$	14
$200 < m \leq 250$	18
$250 < m \leq 300$	9
$300 < m \leq 350$	3

The first two points of the frequency polygon have been plotted and joined.

a. Complete the frequency polygon. (2)

b. Work out the percentage of the potatoes that have a mass of 250 g or less. (2)



(4 marks)

a)

Plot each frequency at the midpoint of its class.

(225, 18) (275, 9) (325, 3)

Join the points with straight lines.

b)

$6 + 14 + 18 = 38$

$\frac{38}{50} \times 100 = 76\%$

a) polygon completed b) 76%

Free for classroom and home use: print, photocopy and share. Not for resale or re-hosting.

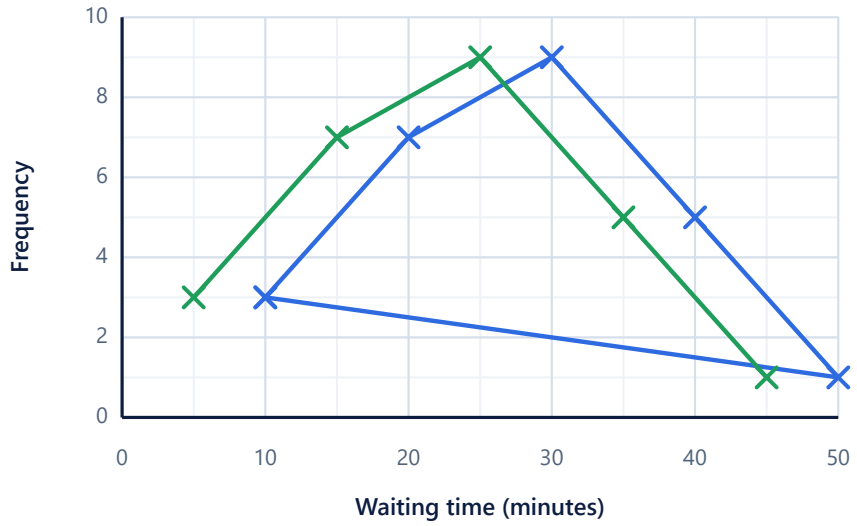
4 A receptionist records the waiting time, t minutes, of 25 patients at a doctor's surgery.

Waiting time, t (minutes)	Frequency
$0 < t \leq 10$	3
$10 < t \leq 20$	7
$20 < t \leq 30$	9
$30 < t \leq 40$	5
$40 < t \leq 50$	1

Mia draws this frequency polygon for the data.

a. Write down two mistakes that Mia has made. (2)

b. On the same grid, draw the correct frequency polygon. (2)



(4 marks)

a)

The points are at the top of each class.

They should be at the midpoints.

The last point is joined back to the first point.

It should not be.

b)

Plot (5, 3) (15, 7) (25, 9) (35, 5) (45, 1)

Join them in order with straight lines.

a) not at midpoints, and closed up b) polygon drawn

Free for classroom and home use: print, photocopy and share. Not for resale or re-hosting.

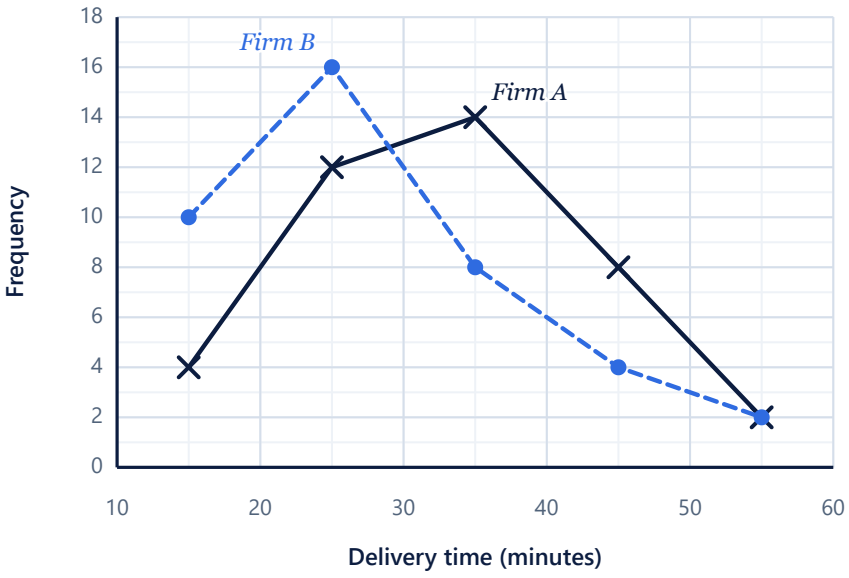
5 Two takeaway firms each recorded the delivery time, t minutes, of 40 orders. The frequency polygons show the results. Firm A is the solid line and Firm B is the dashed line.

The classes are $10 < t \leq 20$, $20 < t \leq 30$ and so on.

a. Write down the modal class for Firm A. (1)

b. Work out how many more of Firm A's orders than Firm B's orders took more than 30 minutes. (2)

c. Which firm generally delivers more quickly? Give a reason for your answer. (2)



(5 marks)

a)

The highest point for Firm A is at 35 minutes.

The modal class is $30 < t \leq 40$

b)

Firm A, more than 30 minutes

$14 + 8 + 2 = 24$

Firm B, more than 30 minutes

$8 + 4 + 2 = 14$

$24 - 14 = 10$

Firm A has 10 more.

c)

Firm B is quicker.

26 of its orders took 30 minutes or less.

Only 16 of the orders for Firm A did.

a) $30 < t \leq 40$ b) 10 c) Firm B, more short times

Free for classroom and home use: print, photocopy and share. Not for resale or re-hosting.