Estimating the median by linear interpolation

Grade 7 | Higher | 5 questions, 21 marks

GCSE Statistics topic practice

Name: _____ **Date:** _____ **Score:** _____ **/ 21**

1 The table shows the heights, h mm, of 50 seedlings.

Height (h mm)	Frequency
$0 < h \leq 10$	5
$10 < h \leq 20$	15
$20 < h \leq 30$	20
$30 < h \leq 40$	10

Use linear interpolation to estimate the median height.

(3 marks)

2 The table shows the times, t minutes, that 60 customers spent in a supermarket.

Time (t minutes)	Frequency
$0 < t \leq 10$	6
$10 < t \leq 20$	14
$20 < t \leq 30$	22
$30 < t \leq 40$	12
$40 < t \leq 60$	6

a. Use linear interpolation to estimate the median time. Give your answer correct to 1 decimal place. (3)

b. Write down one assumption you made in part (a). (1)

(4 marks)

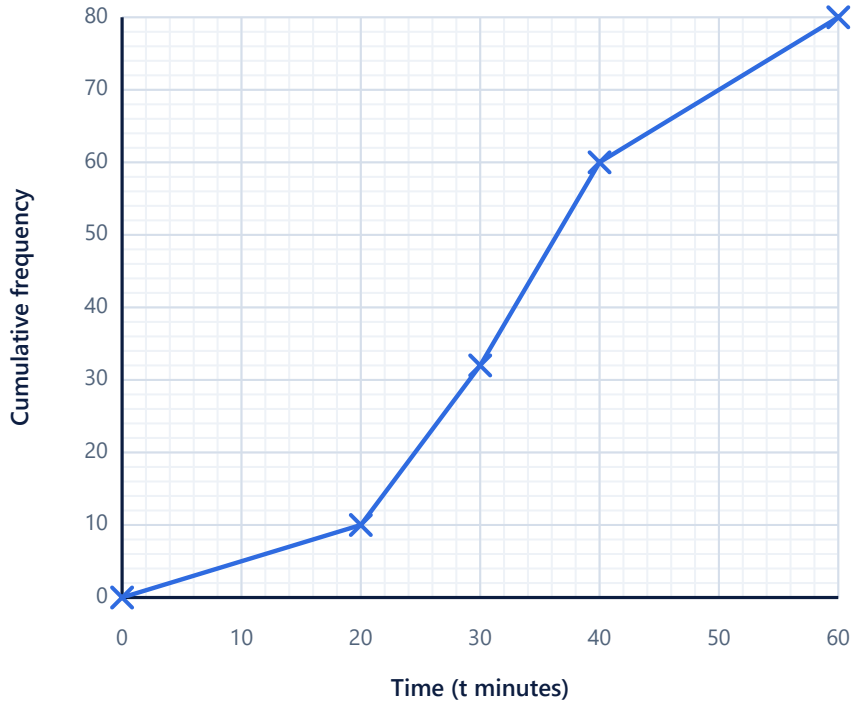
Free for classroom and home use: print, photocopy and share. Not for resale or re-hosting.

3 The table shows the delivery times, t minutes, of 80 pizza orders. The cumulative frequency polygon for these data is also shown.

Time (t minutes)	Frequency
$0 < t \leq 20$	10
$20 < t \leq 30$	22
$30 < t \leq 40$	28
$40 < t \leq 60$	20

a. Use linear interpolation to estimate the median delivery time. Give your answer correct to 1 decimal place. (3)

b. Draw lines on the cumulative frequency polygon to show how the median can be read from it. (1)



(4 marks)

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

4 The table shows the weekly earnings, £e, of the 120 part-time workers at a company.

Weekly earnings (£e)	Frequency
$0 < e \leq 50$	18
$50 < e \leq 100$	30
$100 < e \leq 150$	40
$150 < e \leq 250$	32

a. Use linear interpolation to estimate the median weekly earnings. (3)

b. Explain why your answer to part (a) is only an estimate. (1)

c. Mia says, "The median is in the class $100 < e \leq 150$, so the best estimate of the median is the midpoint, £125." Explain why linear interpolation gives a better estimate than Mia's method. (1)

(5 marks)

---

5 The table shows the times, t minutes, taken by 60 runners to finish a 5 km fun run. Two of the frequencies are missing.

Time (t minutes)	Frequency
$20 < t \leq 25$	9
$25 < t \leq 30$	15
$30 < t \leq 35$	x
$35 < t \leq 45$	y

Using linear interpolation, the estimate of the median time is 31.5 minutes.

a. Work out the value of x. (4)

b. Work out the value of y. (1)

(5 marks)

End of questions | Total 21 marks

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