

Calculator Overlap questions November 2017 Paper 3

1/19 The table shows information about the heights of 80 children.

Height (h cm)	Frequency
$130 < h \leq 140$	4
$140 < h \leq 150$	11
$150 < h \leq 160$	24
$160 < h \leq 170$	22
$170 < h \leq 180$	19

Running total

4

15

39

80

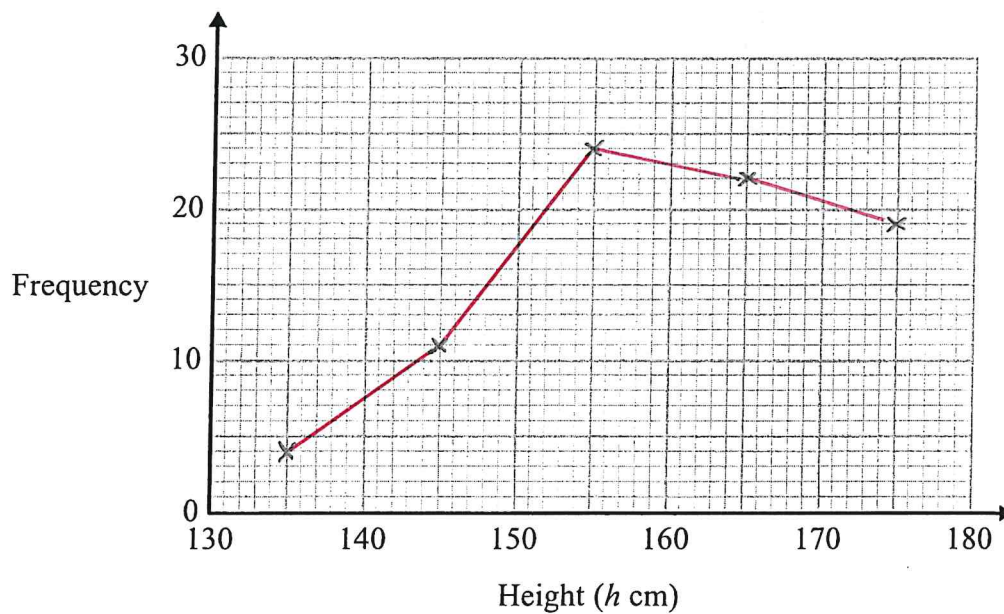
(a) Find the class interval that contains the median.

$$\text{middle} = \frac{80+1}{2} = 40.5$$

..... $160 < h \leq 170$

(1)

(b) Draw a frequency polygon for the information in the table.



(2)

- 2/20 In London, 1 litre of petrol costs 108.9p
 In New York, 1 US gallon of petrol costs \$2.83.
 1 US gallon = 3.785 litres
 £1 = \$1.46

$$\text{Gallon} \stackrel{\times 3.785}{=} \text{litre}$$

$$\stackrel{\div 3.785}{\leftarrow}$$

$$\text{\$} \stackrel{\times 1.46}{=} \text{\pounds}$$

$$\stackrel{\div 1.46}{\leftarrow}$$

In which city is petrol better value for money, London or New York?
 You must show your working.

New York

$$1 \text{ gallon} = \$2.83 = 3.785 \text{ litres} \quad \div 3.785$$

$$\div 1.46 \left(\begin{array}{l} \$0.747688 = 1 \text{ litre} \\ \pounds 0.51 = 1 \text{ litre} \end{array} \right.$$

New York is better value.

(Total 3 marks)

- 3/21 A gold bar has a mass of 12.5 kg. = 12500g
 The density of gold is 19.3 g/cm³
 Work out the volume of the gold bar.
 Give your answer correct to 3 significant figures.

$$D = \frac{M}{V}$$

units need to be consistent

$$V = \frac{M}{D} = \frac{12500}{19.3}$$

$$= 647.6683938$$

$$= 648$$

$$\dots\dots\dots 648 \dots\dots\dots \text{cm}^3$$

(3)

- 5/23 (a) Find the value of the reciprocal of 1.6.
 Give your answer as a decimal.

$$1.6 = \frac{16}{10} \quad \text{reciprocal} = \frac{10}{16} = \dots\dots\dots 0.625 \dots\dots\dots$$

(1)

Jess rounds a number, x , to one decimal place.
 The result is 9.8.

- (b) Write down the error interval for x .

$$\dots\dots\dots 9.75 \leq x < 9.85 \dots\dots\dots$$

(2)

4/22 There are only blue pens, green pens and red pens in a box.
 The ratio of the number of blue pens to the number of green pens is 2 : 5
 The ratio of the number of green pens to the number of red pens is 4 : 1
 There are less than 100 pens in the box.
 What is the greatest possible number of red pens in the box?

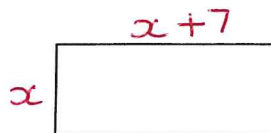
$$\begin{array}{l}
 B : G \\
 2 : 5 \\
 \hline
 \end{array}
 \qquad
 \begin{array}{l}
 G : R \\
 4 : 1 \\
 \hline
 \end{array}
 \qquad
 \text{Find common multiple}$$

$$\begin{array}{l}
 B : \boxed{G} : R \\
 8 : \boxed{20} : 5 \\
 24 : 60 : 15
 \end{array}
 \qquad
 \begin{array}{l}
 33 \text{ parts} \\
 99 \text{ parts} < 100
 \end{array}$$

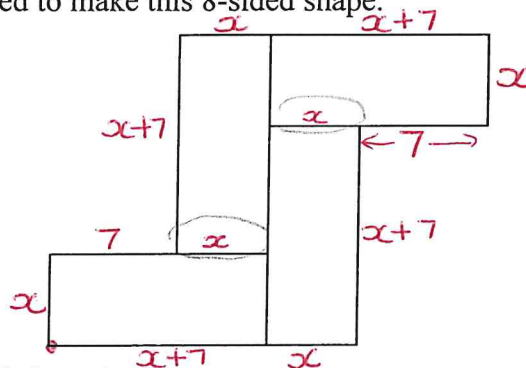
..... 15 red pens

(3)

6/24 Here is a rectangle.



The length of the rectangle is 7 cm longer than the width of the rectangle.
 4 of these rectangles are used to make this 8-sided shape.



The perimeter of the 8-sided shape is 70 cm.
 Work out the area of the 8-sided shape.

$$\begin{aligned}
 \text{Perimeter} &= 8x + 42 \\
 70 &= 8x + 42 \\
 8x &= 28 \\
 x &= 3.5
 \end{aligned}$$

$$\begin{aligned}
 \text{Area} &= \text{rectangle} \times 4 \\
 &= x \times (x+7) \times 4 \\
 &= 3.5 \times 10.5 \times 4 \\
 &= 147
 \end{aligned}$$

..... 147 cm²
 (5)

7/25 Work out $(13.8 \times 10^7) \times (5.4 \times 10^{-12})$
 Give your answer as an ordinary number.

$\boxed{\times 10^7}$ key

$$7.452 \times 10^{-4}$$

$$= 0.0007452$$

0.0007452

(2)

8/26 When a drawing pin is dropped it can land point down or point up.
 Lucy, Mel and Tom each dropped the drawing pin a number of times.
 The table shows the number of times the drawing pin landed point down and the number of times the drawing pin landed point up for each person.

	Lucy	Mel	Tom	Total
point down	31	53	16	100
point up	14	27	9	50
Total	45	80	25	

Rachael is going to drop the drawing pin once.

(a) Whose results will give the best estimate for the probability that the drawing pin will land point up?

Give a reason for your answer.

Mel: she did more trials dropping the pin

(1)

Stuart is going to drop the drawing pin twice.

(b) Use all the results in the table to work out an estimate for the probability that the drawing pin will land point up the first time and point down the second time.

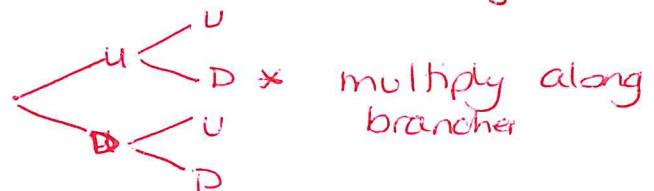
$$P(\text{pin up}) = \frac{50}{150} = \frac{1}{3}$$

$$P(\text{pin down}) = \frac{2}{3}$$

$P(\text{up and then down})$

$$= \frac{1}{3} \times \frac{2}{3}$$

$$= \frac{2}{9}$$



$$\frac{2}{9}$$

(2)

TOTAL FOR PAPER IS 25 MARKS