Grade C Revision Passport

MR BARTON'S SOLUTIONS

Mean from a Grouped Table

Foot Length	FREQ	MP	MP × Freq
$5 < L \leq 10$	5	7.5	37.5
$10 < L \leq 15$	17	12.5	212.5
$15 < L \leq 20$	8	17.5	140
	30		390

a) Median = $\frac{30+1}{2}$ = 15.5th person

They would be in the 2nd group ($10 < L \leq 15$)

We could use Linear Interpolation to find a specific value:

They would be the 10.5th person in that group

The group is 5 wide

→ Median = $10 + \left(\frac{10.5}{17}\right) \times 5 = 13.088...$ cm

↑ Don't worry too much about this!

b) Mean.

Need midpoint (MP) and Midpoint × Freq column

$$\text{Mean} = \frac{\text{Sum of MP} \times \text{Freq}}{\text{Total Freq}} = \frac{390}{30} = 13\text{cm}$$

Sequences

a) 7, 11, 15, 19, 23

+4 +4 +4 +4

(4n) 4 8 12 16 20 → 4n + 3

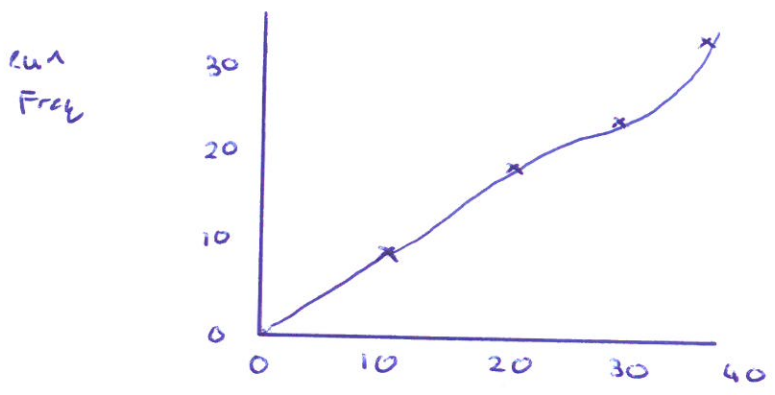
b) 20th term : 4(20) + 3

= 80 + 3 = 83

Cumulative Frequency

Height	Freq	Cum Freq
$0 < h \leq 10$	7	7
$10 < h \leq 20$	8	15
$20 < h \leq 30$	6	21
$30 < h \leq 40$	9	30

Plot cumulative frequency v upper group boundary



Join with smooth curve

Estimation

Round to 1 sig fig!

a) $\frac{2.4 \times 296.3}{(2.371)^2} = \frac{2 \times 300}{2^2}$

$= \frac{600}{4} = 150$

b) Estimate: $1240 \approx 1000$

$10.8p \approx 10p$

$1000 \times 10p = 10{,}000p = £100$

so she is about right

Exactly: 1240×10.8

$= 124 \times 108$

	100	20	4
100	10000	2000	400
8	800	160	32

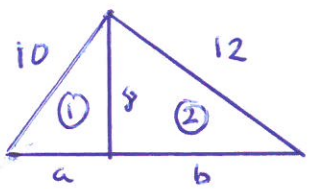
10000
2000
800
400
160
32
13392

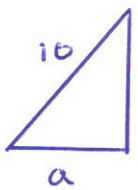
$= 13{,}392p$

$= £133.92$

So £100 is not enough.

Pythagoras



① 

$\sqrt{10^2 - 8^2} = a$

$\sqrt{100 - 64} = a$

$\sqrt{36} = a$

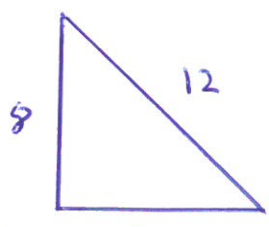
$\rightarrow a = 6$ cm

base $= 6 + 8.944$

$= 14.944$

Area $= \frac{b \times h}{2}$

$= \frac{14.944 \times 8}{2} = 59.8 cm^2$ (1DP)

② 

$b = \sqrt{12^2 - 8^2}$

$= \sqrt{144 - 64}$

$= \sqrt{80}$

$= 8.944...$ cm

Best Buy

5 doughnuts = £3.35 → 10 doughnuts = £7.70

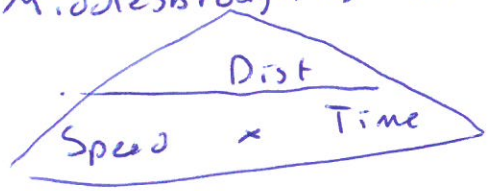
2 doughnuts = £1.38 → 10 doughnuts = £6.90

∴ 2 doughnuts is cheaper

Distance Charts

a) I don't think there is enough info :/

b) Middlesbrough → York = 45 miles



$$\text{Time} = \frac{\text{Distance}}{\text{speed}}$$

$$= \frac{45}{60} = \frac{3}{4} \text{ hour}$$

$$= 45 \text{ mins}$$

Equations

a) $18 + 6x = 2x + 42$

$-2x$: $18 + 4x = 42$

-18: $4x = 24$

$\div 4$: $x = 6$

b) $12 - 3x = 5x + 30$

$+3x$: $12 = 8x + 30$

-30: $-18 = 8x$

$\div 8$: $\frac{-18}{8} = x$

$\rightarrow x = \frac{-9}{4}$ or -2.25

Circles

Area of square $= 15 \times 15 = 225\ cm^2$

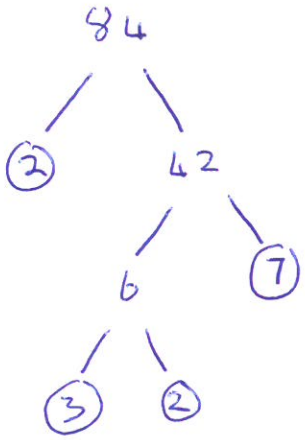
Area of circle $= \pi r^2$

$= \pi \times 7.5^2 = 176.714...\ cm^2$

Area of shaded region $= 225 - 176.714...$

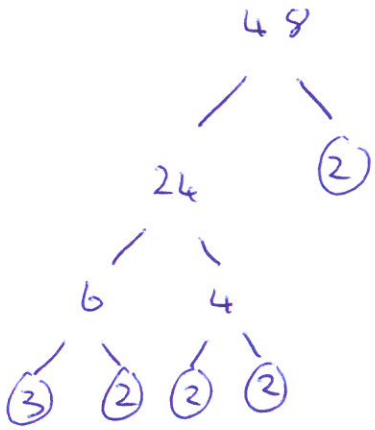
$= 48.3\ cm^2$ (1dp)

HCF & LCM



$84 = 2 \times 2 \times 3 \times 7$

$= 2^2 \times 3 \times 7$

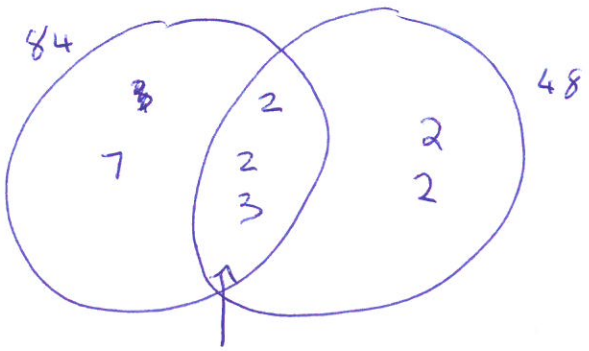


$48 = 2 \times 2 \times 2 \times 2 \times 3$

$= 2^4 \times 3$

$84 = 2 \times 2 \times 3 \times 7$

$48 = 2 \times 2 \times 2 \times 3 \times 2$



HCF $= 2 \times 2 \times 3$

$= \underline{12}$

LCM

$= 7 \times 2 \times 2 \times 3 \times 2 \times 2$

$= \underline{336}$

Ratio

Red : Blue

$$\frac{28}{3} \times \left(\begin{matrix} 3 : 4 \\ 28 : \square \end{matrix} \right) \times \frac{28}{3}$$

$37\frac{1}{3}$ L

Possibly a mistake in the question.

Maybe it is 28L of Blue, in which case:

Red : Blue

$$\times 7 \left(\begin{matrix} 3 : 4 \\ \square : 28 \end{matrix} \right) \times 7$$

21L

Form + Solve Equations

Angles in a quadrilateral add to 360°

$$\rightarrow 90 + x - 10 + x + 20 + 2x - 60 = 360$$

$$\rightarrow 4x + 40 = 360$$

$$-40 \quad 4x = 320$$

$$\div 4 \quad x = 80°$$

Scatter Graphs

a) Positive Correlation

b) On my sheet!

c) I got about 42 kg

Percentage Increase & Decrease

CALC 1

8.80×0.85

$= £7.48$

CALC 2

9.90×0.74

$= £7.33$ (2dp)

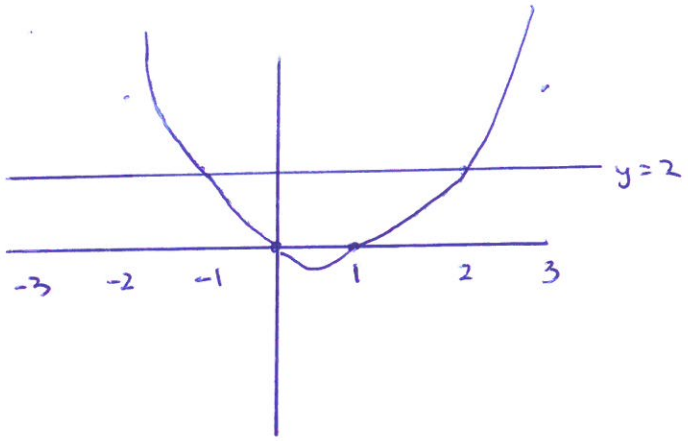
CALC 2 is cheaper

Quadratic Graphs

a) $y = x^2 - x$

x	-3	-2	-1	0	1	2	3
y	12	6	2	0	0	2	6

b)



c) $x^2 - x = 2$

$\rightarrow x = 2$

$x = -1$

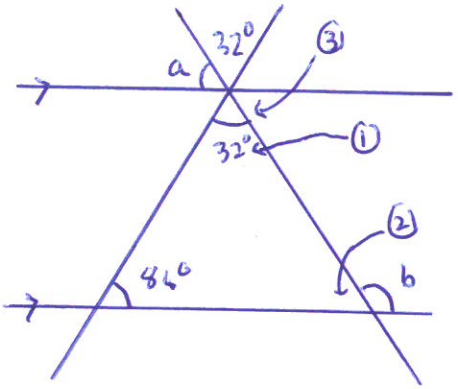
Pie chart

No. People	Sweet	Size of Angle
26	Haribo	78°
48	Minstrels	144°
46	M & Ms	138°

120 people

$\rightarrow \frac{360}{120} = 3°$ per person

Angles on Parallel Lines



① Vertically opposite angles are equal

② = 64°

Angles in a triangle add to 180°

b = 180 - 64° = 116°

Angles on a straight line equal 180°

③ = 64°

Supplementary angles add to 180°

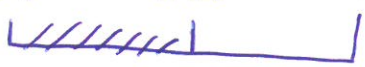
a = 64° vertically opposite angles are equal.

Trial + Improvement

$x^3 + 4x = 24$

x	$x^3 + 4x$	Big / Small
2	16	Small
3	39	Big
2.5	~~23.125~~ 25.625	~~Small~~ Big
2.4	23.424	Small
2.45	24.506	Big

(S) 2.4 (B) 2.45 (B) 2.5



→ $x = 2.4$ (1dp)