Section A: Probability

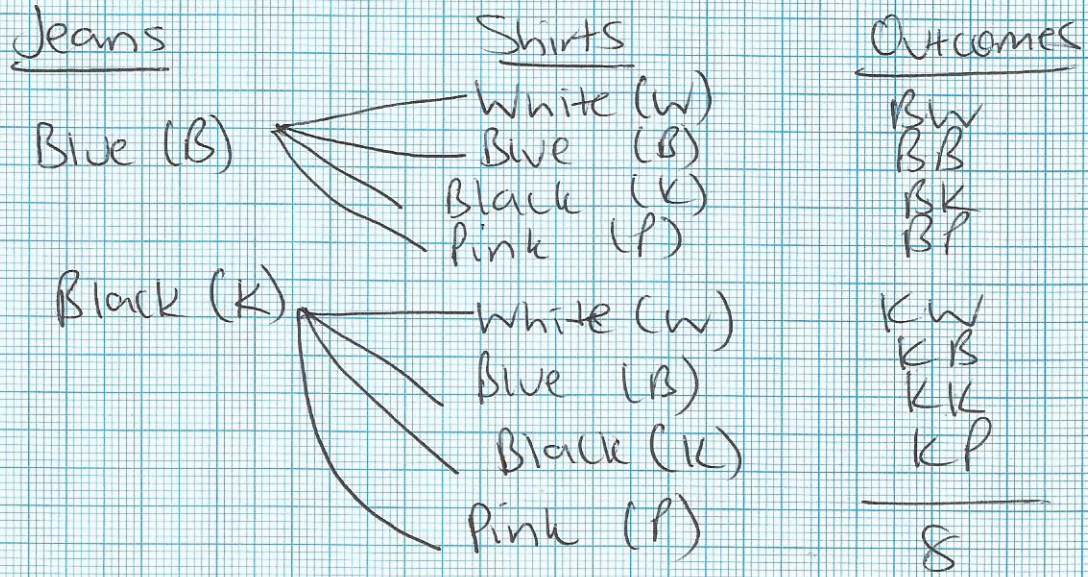
Q1) PROBABILITY = 11 letters in total

a) 2 Bs in PROBABILITY
P = 2/11

b) Vowels = A, E, I, O, U
Vowels in PROBABILITY = O, A, I, I
P = 4/11

Q2) 4 shirts = White, Blue, Black, Pink
2 Jeans = Blue, Black

a)



b) BW, BB, BK, BP, KB = 5
P = 5/8

c) KW, KK, KP = 3
P = 3/8

Q3)

a) $4+3+5+4+4+10 = 30$ total tosses

$6 = 10$ tosses

$\frac{10}{30} = \frac{1}{3}$

$1/3 \times 100 = 33.3\%$

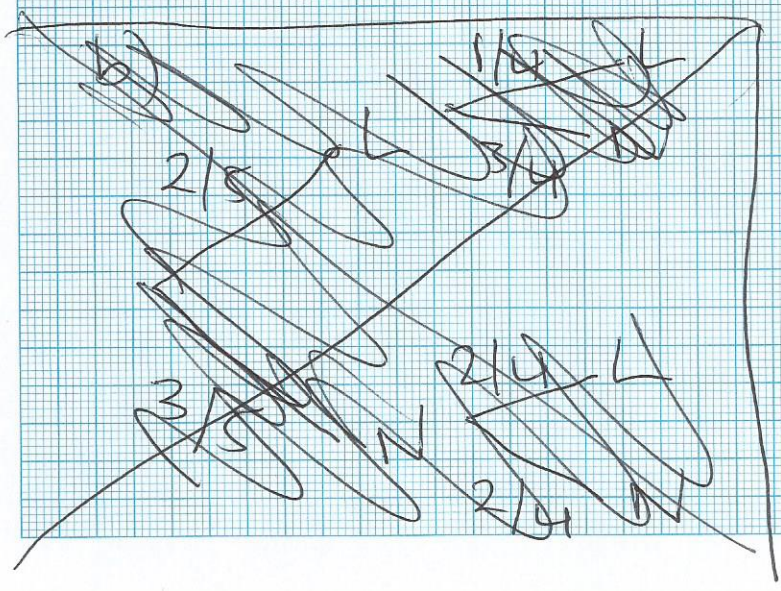
b) Dice was rolled 30 times in question (i.e. Alex rolled ~~the~~ a die 30 times)

$1/3 \times 30 = 10$

c) Yes, it is biased towards 6 as it landed on a 6 ten times, where as the amount of tosses that landed on the numbers between 1-5 were more consistent.

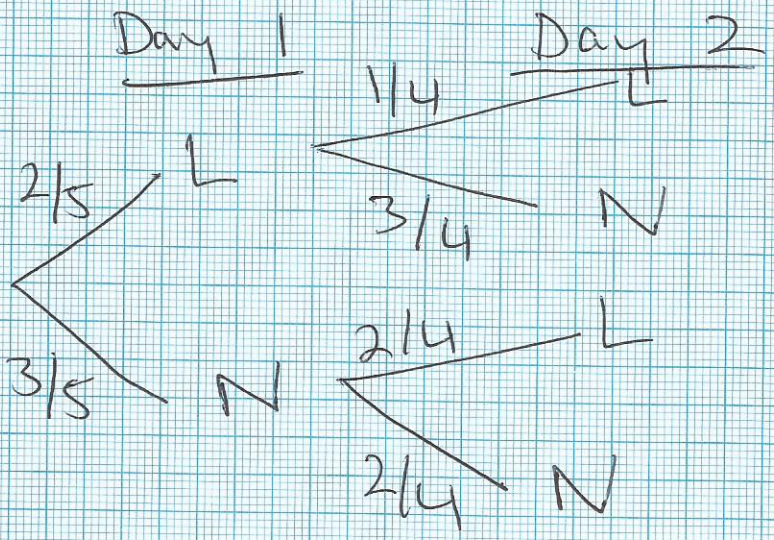
Q4)

a) $1 - \frac{2}{5} = 3/5$



Q4)

b)



c)i) LL out of 4 outcomes

$P = 1/4$

ii) LN, NL = 2 out of 4 outcomes

$P = 2/4$

$= 1/2$

1mm Squares

Section B: Measurement

Q1) 1 KL = 1000 L

210 KL = 210 × 1000

= 210,000 L

= D

Q2) Nearest kg

$\pm \frac{1}{2} \times 1\,kg = \pm 0.5\,kg$

= B

~~Q3) 3,000,000 m/s~~

~~Q3) 3,000,000 m/s~~

~~3.0 × 10^8~~

Q3) $3\overset{1}{0}0\overset{2}{,}0\overset{3}{0}0\overset{4}{,}0\overset{5}{0}0\overset{6}{,}0\overset{7}{0}0$ $\overset{8}{\downarrow}$

$= 3.0 \times 10^8$

= D

Q4) $1\,m^2 = 100\,cm \times 100\,cm$
$(1000\,mm) \quad (1000\,mm)$

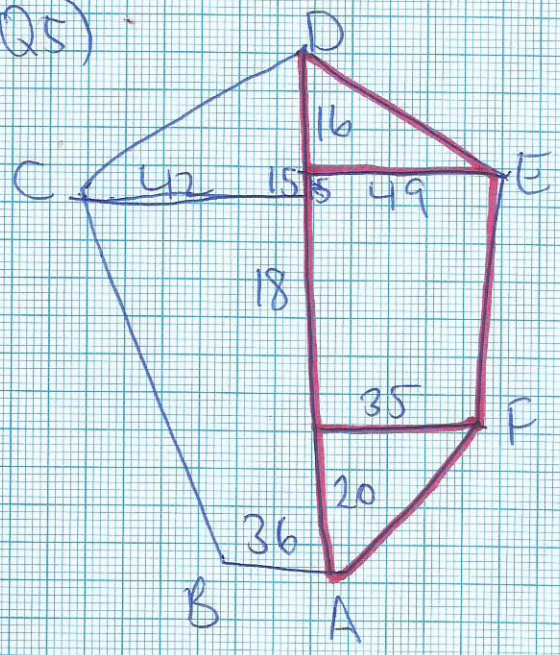
$50{,}000\,mm^2$ to m^2

$50{,}000 \div 1000 \div 1000$

$= 0.05\,m^2$

= A

Q5)



Area of $\Delta DE = 1/2 \times 49 \times 16$

$= 392 m^2$

Area of Trapezium $\Delta EF = \frac{33}{2} \times (49 + 35)$

$= 16.5 \times 84$

$= 1386 m^2$

Area of $\Delta AF = 1/2 \times 35 \times 20$

$= 350 m^2$

Total area of block $= 392 + 1386 + 350$

$= 2128 m^2$

Q6) Application 1 – Paddock & river as one trapezium

$$A = \frac{h}{2}(d_g + d_l)$$

$$A = \frac{252}{2} \times (100 + 83)$$

$$A = 23,058 m^2$$

Application 2 – Paddock & river as two trapeziums side by side.

$$A \text{ of } T1 = \frac{h}{2}(d_g + d_l)$$

$$A \text{ of } T1 = \frac{126}{2} \times (100 + 86)$$

$$A \text{ of } T1 = 11,718 m^2$$

$$A \text{ of } T2 = \frac{h}{2}(d_g + d_l)$$

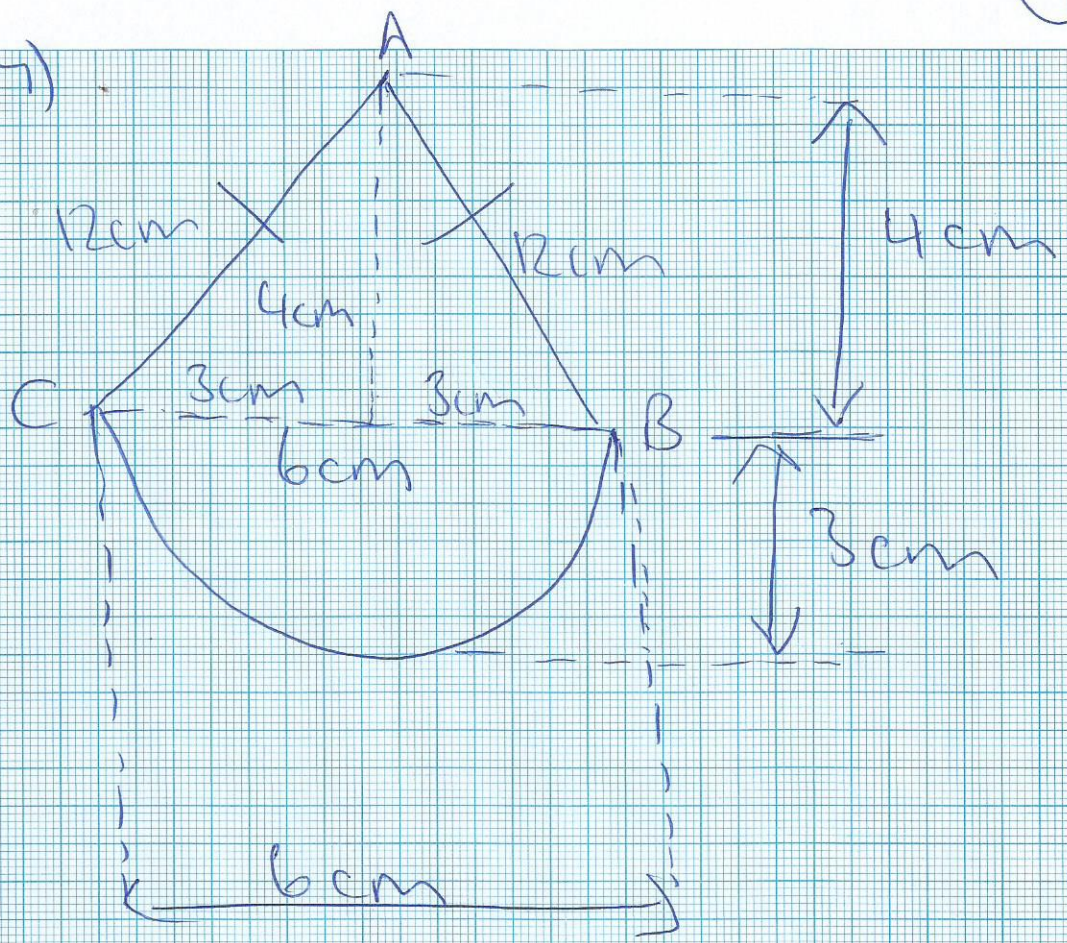
$$A \text{ of } T2 = \frac{126}{2}(86 + 83)$$

$$A \text{ of } T2 = 10,647 m^2$$

Total Area $= 11,718 + 10,647$

$= 22,365 m^2$

Q7)



a) $A = \frac{1}{2}bh$

$A = \frac{1}{2} \times 6 \times 4$

$A = 12 cm^2$

b) Perimeter of a semi-circle

$= (\frac{1}{2} \times \text{circumference}) + \text{diameter}$

$= (\frac{1}{2} \times \pi \times 6) + 6$

$= 9.42 + 6$

~~$= 15.42 cm$~~

$= 15.42 cm$

Perimeter of triangle = Sum of its sides

$= 6 + 12 + 12$

$= 30 cm$

Total $= 15.42 + 30$

$= 45.42 cm$

Q8) $V = \pi r^2 h$

$V = \pi \times 1.3^2 \times 2$

$V = 10.61858817\ m$

$= 10.62\ m^3$

$1\ m^3 = 1\ kL = 1000\ L$

$10.62\ m^3 = 10.62\ kL = (10.62 \times 1000)\ L$

$= 10,620\ L$

Section C: Managing A Home

Q1)

a) $5 \times 110L = 550L$ / day

$1000L = 1KL$

$KL = 550 \div 1000$

$= 0.55KL$

Year costs $= 0.55 \times 2.57 \times 365$

$= 515.9275$

$= \$515.93$

b) $\frac{60}{100} \times 515.93$

$= 309.55$

$= \$309.56$

$\$515.93 - \$309.56$

$= \$206.37$

The Ambrose family will save $206.37 on water costs each year if they install a water-efficient shower head.

Q2) 2,478,000 mW to KW

$1 KW = 1000 W$

$1 W = 1000 mW$

$2,478,000 \div 1000 \div 1000$

$= 2.478 KW$

Q3) 6 metres, 18W LED lights, 5W/m²

18 ÷ 5 = 3.6

6m × 3.6m = 21.6m²

Maximum width = 3.6m

Q4)

a) 1 star = 1009 × 0.2917

= 294.3253

= $294.33

5 star = 416 × 0.2917

= 121.3472

= $121.35

b) $294.33 − $121.35

= $172.98

Q5)

a) 1300J to KJ

1KJ = 1000J

1300 ÷ 1000

= 1.3KJ

Q5)

b) 185 cal to kJ

1 cal = 4.184 kJ

185 cal = 185 × 4.184

= 774.04 kJ

c) 1.28 MJ to Cal

1 MJ = 1,000,000 J = 1000 kJ

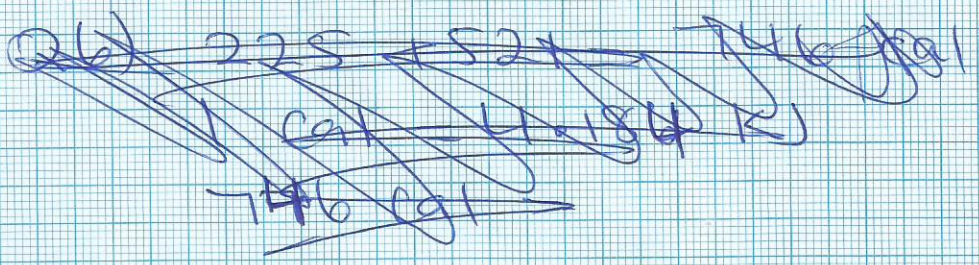
1.28 MJ = 1,280,000 J = 1280 kJ

1 cal = 4.184 kJ

1280 ÷ 4.184

= 305.92734 23

= 305.93 cal



Q6) 255 + 521 = 776 cal

1 cal = 4.184 kJ

776 cal = 776 × 4.184

= 3246.784

$\frac{3246.784}{8400} \times 100 = 38.652190 48$

= 39%