"Mind Your Maths" Answers 1
Year 10 Exam Revision

Answer 1

$\frac{15}{25} \times 100 = 60\%$ are black

[2 marks]

Answer 2

(i) $\frac{1}{6}$ **(ii)** $\frac{1}{2}$ **(iii)** 0 **(iv)** $\frac{1}{3}$

(v) $\frac{2}{3}$ **(vi)** 1 **(vii)** $\frac{2}{3}$ **(viii)** $\frac{1}{3}$

[8 marks]

Answer 3

(i)

Number of stars	*	**	***	****	*****
Frequency	1	8	6	3	2
Cumulative Frequency	1	9	15	18	20

[2 marks]

(ii) Two stars (The number of stars that occurs most often)

[1 mark]

(iii) $\frac{20 + 1}{2} = 10.5^{th}$ Both 10^{th} and 11^{th} are THREE STARS

[2 marks]

Answer 4

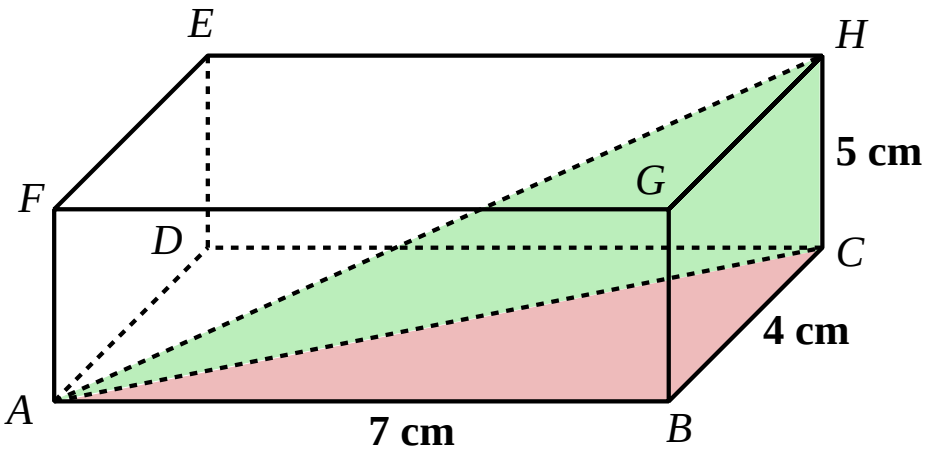
(i) $A = 62°$ (Angle at circumference is half the angle at the centre)

[1 mark]

(ii) $B = 8°$ (Angles in any quadrilateral sum to 360°)

[2 marks]

Answer 5



(i) Long diagonal of box is given by 3D version of Pythagoras' Theorem.

$$AH = \sqrt{7^2 + 4^2 + 5^2}$$

$$= 9.487$$

[2 marks]

(ii) The efficient method is to use answer (i) which is the hypotenuse of the green triangle, along with the 5 cm in the green triangle which is opposite the angle to be found at corner *A* in the green triangle.

$$\angle HAC = arcsin\left(\frac{5}{9.487}\right)$$

$$= 31.8°$$

[4 marks]

Answer 6

Number of Commendations	Number of Pupils	Mid-Interval Value	Contribution towards total
$0 \leqslant x \leqslant 8$	60	4	240
$9 \leqslant x \leqslant 15$	30	12	360
$16 \leqslant x \leqslant 26$	18	21	378
$27 \leqslant x \leqslant 45$	12	36	432
	120	<= Totals =>	1410

$$\text{Mean} = \frac{1410}{120}$$

$$= 11.8 \text{ commendations per pupil}$$

[4 marks]

Answer 7

(i) $\angle OAB = 47.5°$ **(ii)** $\angle BDC = 47.5°$

(iii) $\angle OCD = 71.5°$ **(iv)** $\angle AED = 108.5°$

[2, 1, 1, 1 marks]

Answer 8

(i) $B = k t^3$

$72 = k \times 2^3$

$k = \frac{72}{8}$

$= 9$ and so the formula is $B = 9 t^3$

[3 marks]

(ii) When $t = 4$, $B = 9 \times 4^3$

$B = 576$

[2 marks]

(iii) When $B = \frac{1}{3}$ we have, $\frac{1}{3} = 9 \times t^3$

$t^3 = \frac{1}{27}$

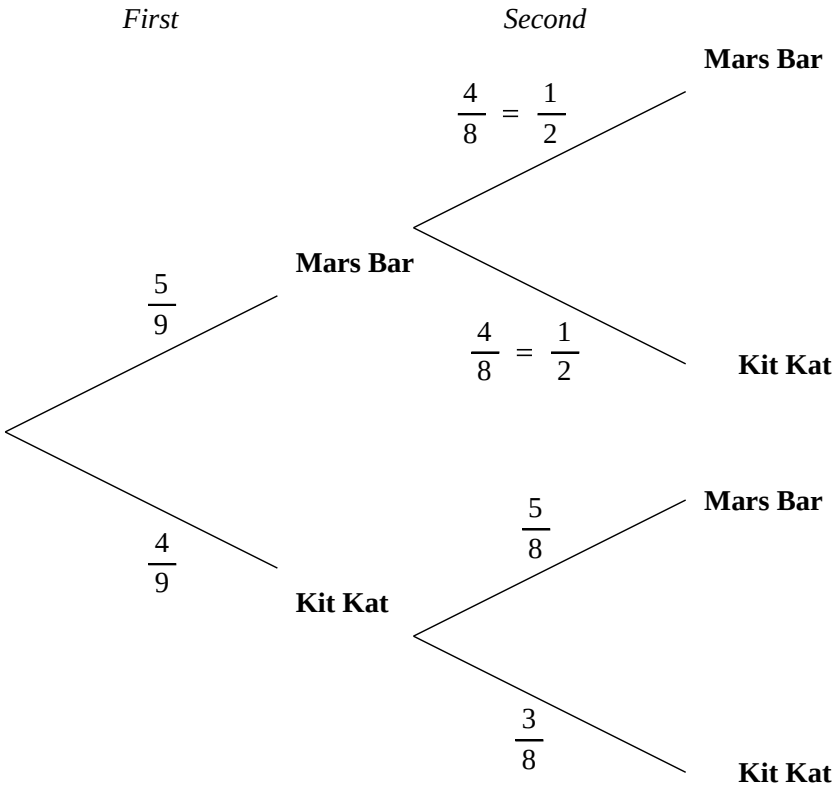
$t = \sqrt[3]{\frac{1}{27}}$

$t = \frac{1}{3}$

[2 marks]

Answer 9

(a)



[2 marks]

(b) **(i)** $p(\text{Kit Kat, Kit Kat}) = \frac{4}{9} \times \frac{3}{8} = \frac{1}{6}$

[2 marks]

(ii) $p(\text{Mars Bar, Kit Kat}) + p(\text{Kit Kat, Mars Bar})$

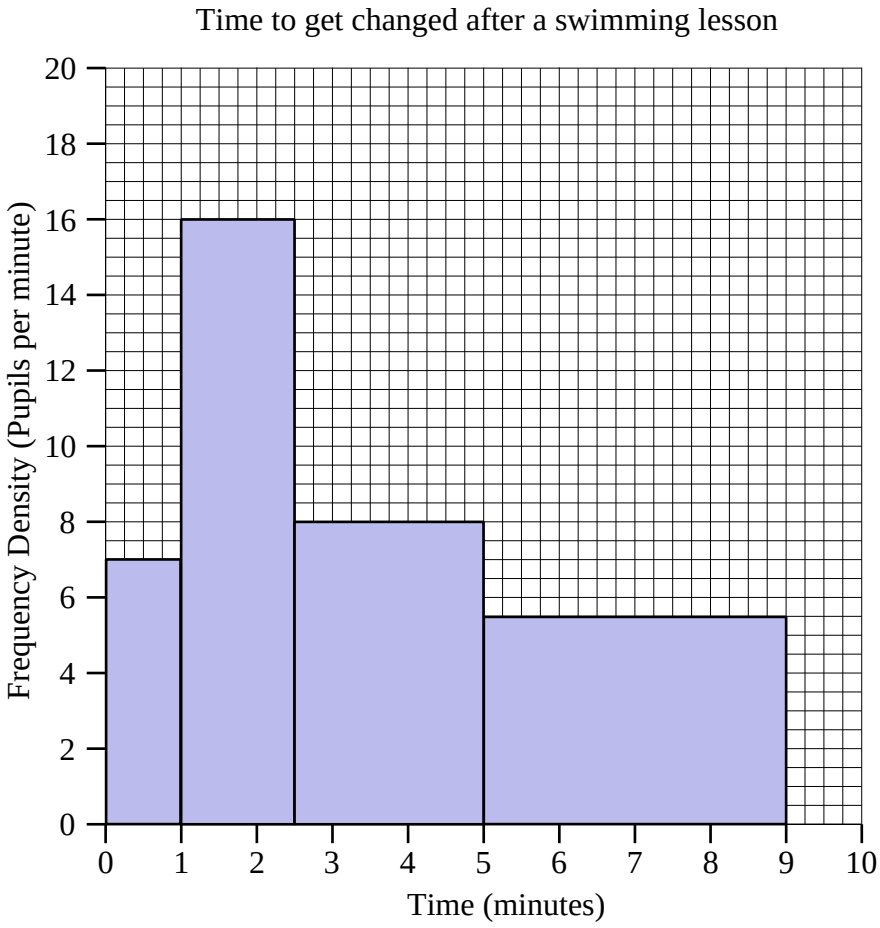
$$= \frac{5}{9} \times \frac{4}{8} + \frac{4}{9} \times \frac{5}{8}$$

$$= \frac{5}{9}$$

[2 marks]

Answer 10

Time, t (minutes)	Frequency
$0 \leqslant t < 1$	7
$1 \leqslant t < 2.5$	24
$2.5 \leqslant t < 5$	20
$5 \leqslant t < 9$	22



[6 marks]

Answer 11

(i) The Length Scale Factor (*LSF*) going big to small is "6 from 9"

$$LSF = \frac{6}{9} = \frac{2}{3}$$

$$\therefore DC = \frac{2}{3} \times 12$$

$$= 8 \text{ cm}$$

[2 marks]

(ii) $AR = 5 \times \frac{3}{2} = 7.5 \text{ cm}$

[2 marks]

(iii) Area Scale Factor (ASF) going small to big is,

$$ASF = (LSF)^2$$

$$= \left(\frac{3}{2}\right)^2$$

$$= \frac{9}{4}$$

$$\text{Area of } APQR = \frac{9}{4} \times 32$$

$$= 72 \text{ cm}^2$$

$$\text{Area Shaded} = \text{Area } APQR - \text{Area } ABCD$$

$$= 72 - 32$$

$$= 40 \text{ cm}^2$$

[4 marks]