

Exam Paper 1 Solutions 2005

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1. Given $3.8 - (7.36/8)$

Remembering **BODMAS** we do the Division first then the Subtraction.

$$3.8 - 0.92 = 2.88$$

2. Given $2\frac{1}{3} + \frac{5}{6}$ of $1\frac{2}{5}$

Using the rules for fractions we have

Make top heavy and do the 'of' (multiplication) first. $\frac{5}{6} \cdot \frac{7}{5} = \frac{7}{6}$

We then do the addition

$$\frac{7}{3} + \frac{7}{6} = \frac{14}{6} + \frac{7}{6} = \frac{21}{6} = 3.5$$

3. Given 12.5% of £140

12.5% as a fraction is $\frac{1}{8}$

Hence we have $\frac{1}{8} \cdot 140 = 17.5$

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4. Given the two dice there are 36 possible combinations

0	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

There are 9 possible values that are greater than 7 and less than 10. Hence probability is $\frac{9}{36} = 0.25$

5. Given that the values plot to give a straight line.

Gradient equals $\frac{Y_2 - Y_1}{X_2 - X_1} = \frac{4 - 6}{1 - 0} = -2$

The c value is where the line cross y-axis i.e. $x=0$ $c = 6$

Hence equation is $y = -2x + 6$

6. Solving we get:- $\frac{2}{x} + 1 = 6$

$$\frac{2}{x} = 6 - 1$$

$$\frac{2}{x} = 5$$

$$x = \frac{2}{5}$$

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7. Creating a cumulative frequency table we get:-

Speed	Frequency	Cumulative Frequency
30	1	1
40	4	5
50	9	14
60	14	28
70	38	66
80	47	113
90	51	164
100	32	196
110	4	200

The median value is the 100th value which lies in Speed equal to 80.

8. From the sequence

(a) The next term in the sequence is $5^2 - 3^2$

(b) The n^{th} term is given by

$$(n + 1)^2 - (n - 1)^2$$

$$(n^2 + 2 \cdot n + 1) - (n^2 - 2 \cdot n + 1)$$

$$4n$$

9. (a) Litres put in the car is equal to

$$\frac{3000}{75} = 40 \text{ litres}$$

Car uses 5 litres per hour, after 3 hours car has used up 15 litres.
Hence there is $40 - 15 = 25$ litre left in the car.

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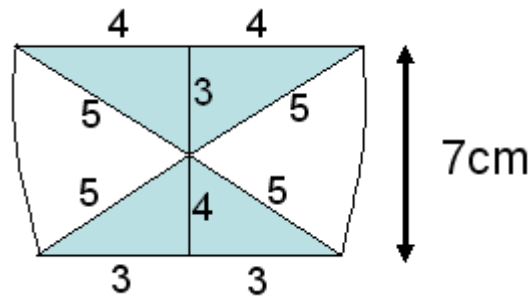
(b) The amount of fuel in the car is: $\frac{2000}{c}$

The amount of petrol per hour is K.

Hence formula for the fuel left in the car is equal to:

$$R = \frac{2000}{c} - Kt \quad t = \text{hours}$$

10. From the diagram we can deduce the following:



Width of the base to $3+3=6\text{cm}$

Key to this question was the 3,4,5 triangle.

11. Given $f(x) = 4\sqrt{x} + \sqrt{2}$

(a) Simplifying $f(72)$ we get

$$f(72) = 4\sqrt{72} + \sqrt{2} = 4\sqrt{36 \cdot 2} + \sqrt{2} = 4 \cdot 6 \cdot \sqrt{2} + \sqrt{2} = 25 \cdot \sqrt{2}$$

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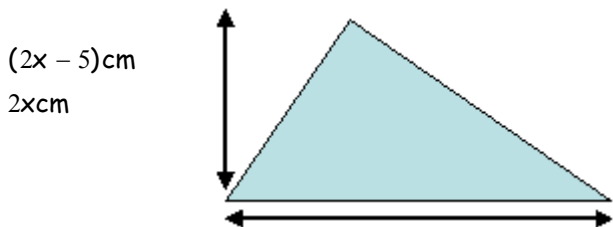
(b) Given $f(t) = 3\sqrt{t}$

We have $4\sqrt{t} + \sqrt{2} = 3\sqrt{2}$ $4\sqrt{t} = 2\sqrt{2}$

Square both sides $16t = 8$

$$t = \frac{1}{2}$$

12. Given the diagram below the area is:



$$\text{Area} = \frac{1}{2} \text{base} \cdot \text{height}$$

$$7 = \frac{1}{2} \cdot 2x \cdot (2x - 5)$$

Rearranging we get $2x^2 - 5x - 7 = 0$

Factorising we get $(2x - 7)(x + 1) = 0$

$x = 3.5\text{cm}$ and $x = -1$

We reject the negative value since length cannot be negative.

Solution is $x = 3.5\text{cm}$