

Credit Paper 1 Exam Solutions 2007

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1. Given $6.04 + 3.72 \times 20$

Remembering **BODMAS** we do the **M**ultiplication first then the **S**ubtraction.

$$3.72 \times 20 = 74.4 \qquad 6.04 + 74.4 = 80.44$$

2. Given $3\frac{1}{6} \div 1\frac{2}{3}$

Using the rules for fractions we have

Make top heavy and then turn second term upside down and change to times

$$\frac{19}{6} \times \frac{3}{5} = \frac{57}{30}$$

We then simplify

$$\frac{57}{30} = \frac{19}{10} = 1\frac{9}{10}$$

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3. Given there are 400 in an audience and the probability is $\frac{5}{8}$ that you pick a male. Calculating the number of males in the audience we get:

$$\frac{5}{8} \text{ of } 400 = 400 \div 8 \times 5 = 250 \text{ males}$$

4. Given the formula $p = \frac{2(m-4)}{3}$

Rearranging for m we get:

$$\begin{aligned} p &= \frac{2(m-4)}{3} \\ 3p &= 2(m-4) \\ 3p &= 2m-8 \\ 3p+8 &= 2m \\ 2m &= 3p+8 \\ m &= \frac{3p+8}{2} \end{aligned}$$

5. Given $(2x+3)^2 - 3(x^2-6)$. Removing brackets and simplifying we get:

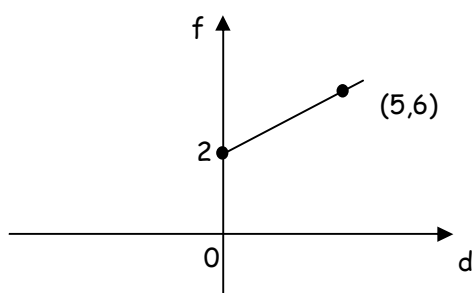
$$\begin{aligned} &(2x+3)^2 - 3(x^2-6) \\ &= 4x^2 + 12x + 9 - 3x^2 + 18 \\ &= x^2 + 12x + 27 \end{aligned}$$

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6. Given the graph for calculating the taxi fare for a journey.
There is a standard call out charge of £2 plus a fixed amount per km.



The equation of the line is given by:

$$\text{Gradient is } \frac{y_2 - y_1}{x_2 - x_1} = \frac{6 - 2}{5 - 0} = \frac{4}{5}$$

y - intercept = 2

Line has equation $f = \frac{4}{5}d + 2$

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7. Given $a^{\frac{1}{2}}(a^{\frac{1}{2}} - 2)$.

Removing the brackets and simplify using rules of indices we get:

$$a^{\frac{1}{2}}(a^{\frac{1}{2}} - 2) = a^{\frac{1}{2}} \times a^{\frac{1}{2}} - 2a^{\frac{1}{2}} = a - 2a^{\frac{1}{2}}$$

6. Given the equation below we can solve:

Remembering change side change sign

$$x - 2(x + 1) = 8$$

$$x - 2x - 2 = 8$$

$$-x = 8 + 2$$

$$-x = 10$$

$$x = -10$$

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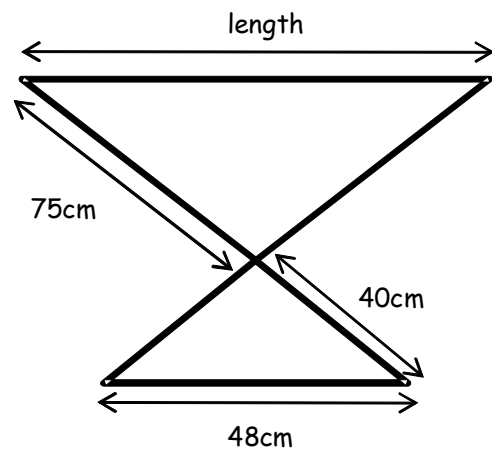
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8. Given the iron board is made up of two mathematically similar triangles and the diagram. To work out whether the length is at least 80cm we have:

$$ESF = \frac{75}{40} = \frac{15}{8}$$

$$\text{Hence length} = \frac{15}{8} \times 48 = 90\text{cm}$$

So length meets Mick's requirements.



9. Given the square with sides x cm and diagonal 6cm.

Using Pythagoras to find x as a surd in its simplest form we have:

$$x^2 + x^2 = 6^2$$

$$2x^2 = 36$$

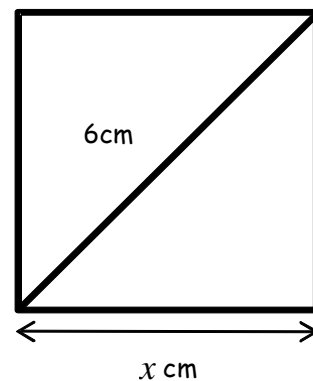
$$x^2 = \frac{36}{2}$$

$$x^2 = 18$$

$$x = \sqrt{18}$$

$$x = \sqrt{9} \times \sqrt{2}$$

$$x = 3\sqrt{2}$$



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10. Given the relationship: $T = \frac{k}{L^3}$

If we double L then T will: $T = \frac{k}{(2L)^3} = \frac{k}{8L^3}$ be reduced by $\frac{7}{8}$.

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11. Given the cinema has 300 seats which are either standard (x) or deluxe (y).

(a) An equation illustrating this information is : $x + y = 300$

Given a standard seat costs £4 and deluxe seat costs £6.
When all seats are sold the ticket sales are £1380.

(b) An equation illustrating this information is : $4x + 6y = 1380$

(c) To find how many standard seats and deluxe there are we have:

$$x + y = 300 \quad \rightarrow \text{equation A}$$

$$4x + 6y = 1380 \quad \rightarrow \text{equation B}$$

$$4x + 4y = 1200 \quad \rightarrow \text{equation C (4} \times \text{equation A)}$$

$$4x + 6y = 1380$$

$$2y = 180 \quad \rightarrow \text{equation B - equation C}$$

$$y = 90$$

Sub $y = 90$ into equation A

$$x + 90 = 300$$

$$x = 300 - 90 = 210$$

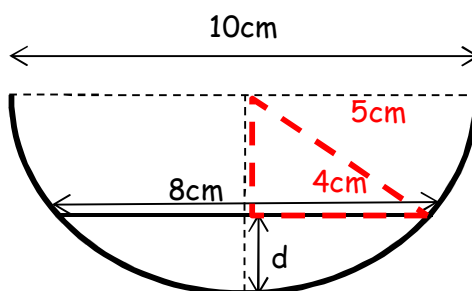
There are 210 standard seats and 90 delux seats.

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12. Given the diagram of the roof guttering which is semi-circle in shape and has a diameter of 10cm:

To find the depth of the water in the gutter we have:



Red lines have been added to the diagram.

Using Pythagoras Theorem vertical red line is:

$$x^2 = 5^2 - 4^2$$

$$x^2 = 9$$

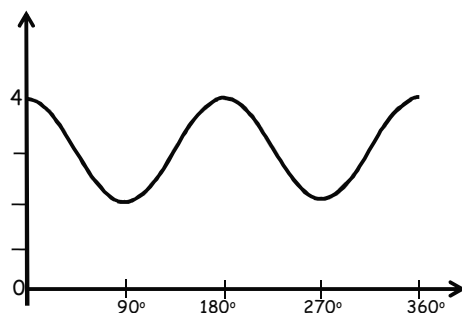
$$x = 3$$

Depth of water is $5\text{cm} - 3\text{cm} = 2\text{cm}$

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13. Given the trigonometry graph of $y = \cos bx^\circ + c$ below:



Calculating the values of b and c we get:

$b = 2$ how many times it repeats itself in 360°

$c = 3$ how much the standard cosine graph has been moved up.

14. Given the sum sequence formula: $S_n = 3^n - 1$

(a) Sum of the first 2 terms is: $S_2 = 3^2 - 1 = 9 - 1 = 8$

(b) When $S_n = 80$ then n will be:

$$S_n = 3^n - 1 = 80$$

$$3^n - 1 = 80$$

$$3^n = 81$$

$$n = \sqrt[3]{81}$$