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1. Given 5.04 + 8.4 ÷ 7

Remembering BODMAS we do the Division first then the Addition.

5.04 + 1.2 = 6.24

2. $\frac{2}{7}(1\frac{3}{4}+\frac{3}{8})$ Given

Using the rules for fractions we have

Make top heavy and find a common factor for the $\frac{7}{4}+\frac{3}{8}=\frac{14+3}{8}=\frac{17}{8}$
denominator then do the Brackets.

We then do the Multiplication

$$\frac{2}{7}\cdot\frac{17}{8}=\frac{17}{28}$$

3. Given $3(2x - 4) - 4(3x + 1)$

Using the rules of arithmetic to simplify we get

$6x - 12 - 12x + 4 = -6x - 16$

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4. Given $f(x) = 7 - 4x$

(a) For $f(-2)$

We have $f(-2) = 7 - 4(-2) = 15$

(b) For $f(t) = 9$

We have $7 - 4t = 9$ $\qquad t = \dfrac{9 - 7}{-4}$ $\qquad t = \dfrac{-1}{2}$

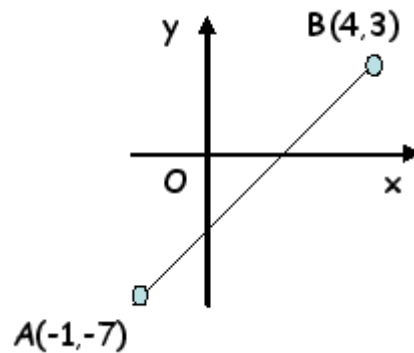**5.** Given $2x^2 - 7x - 15$

Factorising we get

$(2x + 3)(x - 5)$

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6. Given the diagram below.

(a) Gradient is given by

$$m_{AB} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3 - (-7)}{4 - (-1)} = \frac{10}{5} = 2$$

(b) Given AB cuts y-axis at (0,-5), the equation of the line is given by

$$y = 2x - 5$$

(c) Given (3k, k) lies on the line then k equals

$$k = 2(3k) - 5 = 6k - 5 \qquad k = \frac{5}{5} = 1$$

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7. Given the information below

3nights $+ 2$breakfast   Bill £145

(a) Equation is $3n + 2b = 145$

5nights $+ 3$breakfast   Bill £240

(b) Equation is $5n + 3b = 240$

(c) One breakfast costs.

$3n + 2b = 145$ Equation 1
$5n + 3b = 240$ Equation 2

Multiple equation 1 by 5 and equation 2 by 3 and then subtract equation 2 from equation 1 we get

$15n + 10b = 725$
$15n + 9b = 720$

$b = 725 - 720 = 5$

Breakfast costs £5

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8. Given the information

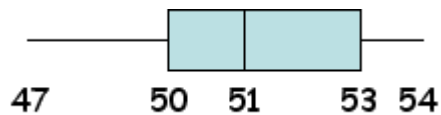$red, green, blue, yellow$ All numbered 1 - 10

(a) Probability of picking a 6 is:

$$\frac{4}{40} = 0.1$$

(b) Probability of picking a yellow 6 is:

$$\frac{1}{40} = 0.025$$

9. Given

47   50 51   53 54

Matchboxes containing less than 50 matches correspond to the lower quartile.

Hence 25% contain fewer than 50 matches.

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10.   Given the ratio information

Parent's	teacher	pupils
1	3	15

(a)   For 45 pupils we should have 3 teachers (3x3 = 9)

(b)   Given 100 tickets we need groups of 19.

So we have

$\dfrac{100}{19} = 5.263$ Maximum number of groups is 5

There are 15 pupils in each group hence we have

$15 \cdot 5 = 75$

11.   Given $1, 3, 5, 7, 9$

(a)   Sum of first 3 numbers is $S_3 = 1 + 3 + 5 = 9$

(b)   Sum of first n numbers is $S_n = n^2$

   $n = 1$ 1^2
   $n = 2$ $1 + 3 = 4 = 2^2$
   $n = 3$ $1 + 3 + 5 = 9 = 3^2$ ..etc

(c)   Sum of first n numbers is

   $(n + 1)^{th}$ term $(n + 1)^2 = n^2 + 2n + 1$

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12. Given $8^{\frac{2}{3}}$

(a) We have $8 = 2^3$

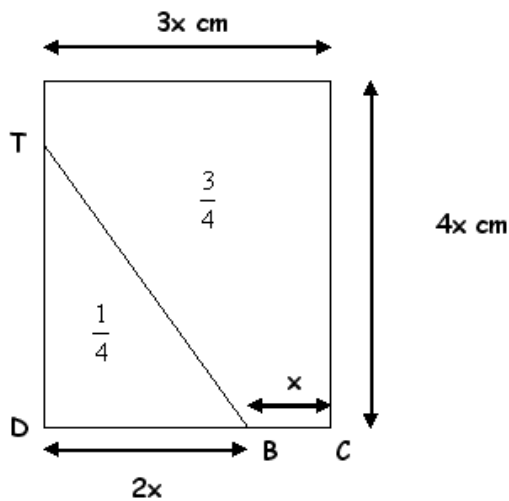$$8^{\frac{2}{3}} = 2^{3 \cdot \frac{2}{3}} = 2^2 = 4$$

(b) Given $\dfrac{\sqrt{24}}{\sqrt{2}}$

$$\frac{\sqrt{24}}{\sqrt{2}} = \frac{\sqrt{12} \cdot \sqrt{2}}{\sqrt{2}} = \sqrt{12} = \sqrt{4} \cdot \sqrt{3} = 2\sqrt{3}$$

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13. Given diagram below

Whole area of board is $\quad 3x \cdot 4x = 12x^2$

Hence area TBD is $\qquad \dfrac{1}{4} \cdot 12x^2 = 3x^2$

Using the area formula for a triangle we have

$$A = \frac{1}{2} \cdot TD \cdot DB \cdot \sin(D) \qquad\qquad \sin(D) = \sin(90)^\circ = 1$$

$$3x^2 = \frac{1}{2} TD \cdot 2x \cdot 1$$

$$TD = \frac{6x^2}{2x} = 3x$$