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1. Given $56.4 - 1.25 \times 40$

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

$$56.4 - 50 = 6.4$$

2. Given $1\frac{3}{5} + 2\frac{4}{7}$

Using the rules for fractions we have

Make top heavy and find the common denominator.

$$\frac{8}{5} + \frac{18}{7} = \frac{56 + 90}{35}$$

We then do the addition and simplify

$$\frac{56 + 90}{35} = \frac{146}{35} = 4\frac{6}{35}$$

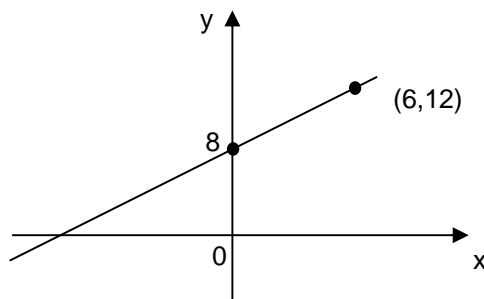
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3. Given $f(x) = 4 - x^2$, then $f(-3)$

$$f(-3) = 4 - (-3)^2 = 4 - 9 = -5$$

4. Given a straight line has equation



Gradient is $\frac{y_2 - y_1}{x_2 - x_1} = \frac{12 - 8}{6 - 0} = \frac{4}{6} = \frac{2}{3}$

$c = y$ - intercept = 8

Line has equation $y = \frac{2}{3}x + 8$

5(a). Given $4x^2 - y^2$

Factorising and noting it is the difference of 2 squares we get:

$$(2x + y)(2x - y)$$

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5(b) Simplifying $\frac{4x^2 - y^2}{6x + 3y}$, using result in part (a) we get:

$$\frac{4x^2 - y^2}{6x + 3y} = \frac{(2x - y)(2x + y)}{3(2x + y)} = \frac{(2x - y)}{3}$$

6. Given the equation below we can solve:

Remembering change side change sign

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

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

$$-x = 8 + 2$$

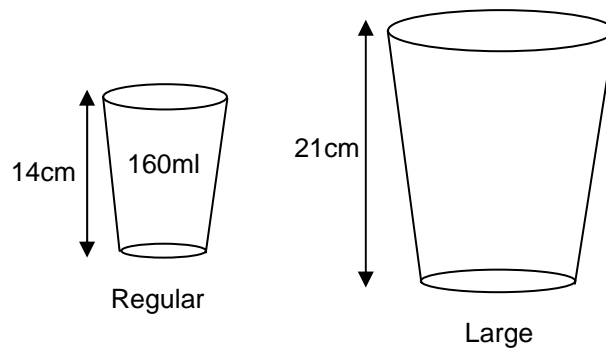
$$-x = 10$$

$$x = -10$$

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7. Given the coffee cup diagram and told that they are mathematically similar, the volume of the regular cup is 160ml so the large cup is:



$$ESF = \frac{21}{14} = \frac{3}{2}$$

Since volume is 3 dimensions we have

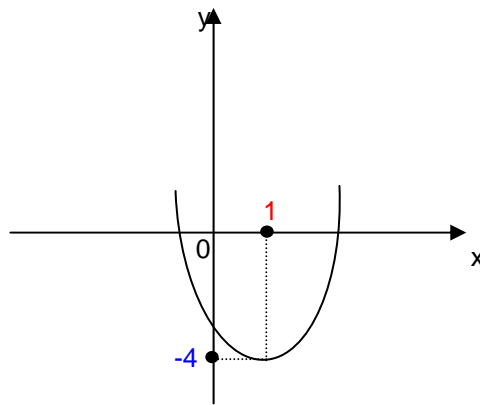
$$\text{volume of large cup} = \left(\frac{3}{2}\right)^3 \times 160 = \frac{27}{8} \times 160 = 540ml$$

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8. Given the graph of $y = x^2$ has been shifted as shown, the new equation is:



From your knowledge of quadratics you should be able to write down the equation:

$$y = (x - 1)^2 - 4$$

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9. Given Euan plays 20 games of snooker and wins x and loses y .

(a) An equation illustrating this information is : $x + y = 20$

Given he gets £5 for every game won and £2 for every game lost and he has £79 in total:

(b) An equation illustrating this information is : $5x + 2y = 79$

(c) If we solve the simultaneous equations in (a) and (b) for x we have:

$$x + y = 20 \quad \rightarrow \text{equation 1}$$

$$5x + 2y = 79 \quad \rightarrow \text{equation 2}$$

$$2x + 2y = 40 \quad \rightarrow 2 \times \text{equation 1}$$

$$5x + 2y = 79$$

$$3x = 39 \quad \rightarrow \text{equation 2} - (2 \times \text{equation 1})$$

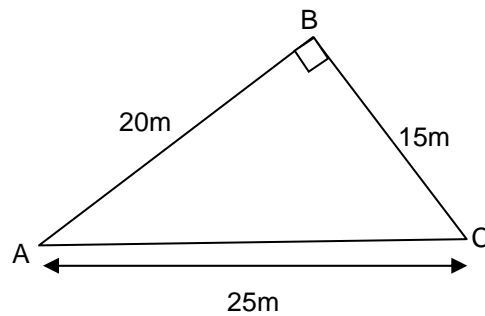
$$x = \frac{39}{3}$$

$$x = 13 \quad \text{He won 13 games in total.}$$

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10. Given the right-angled triangle ABC below:



- (a) The area of the triangle is:

$$Area = \frac{1}{2} \times base \times height$$

$$A = \frac{1}{2} \times 20 \times 15$$

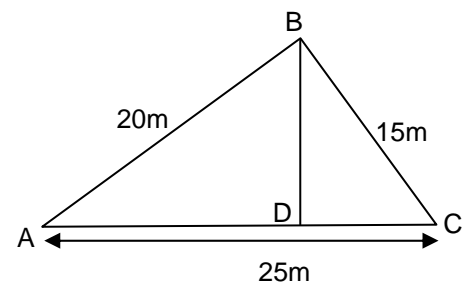
$$A = 150m^2$$

- (b) To find BD, the height of the triangle ABC, using part (a) we have:

$$150 = \frac{1}{2} \times base \times height$$

$$150 = \frac{1}{2} \times 25 \times h$$

$$h = \frac{300}{25} = 12m$$



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11(a). Given the cost of a session at the leisure pool is £3.

An equation for x sessions is:

$$C = 3x$$

(b) (i) Given a monthly card costs £20 with first 6 sessions free the £2 there after. The cost for a month with 15 sessions is:

$$C = £20 + 9 \times 2 = £38$$

(ii) An algebraic expression for the total for a monthly card for x sessions is:

$$C = 20 + 2(x - 6) = 2x + 8$$

(c) For monthly card to be cheaper we need

$$2x + 8 < 3x$$

$$8 < 3x - 2x$$

$$8 < x$$

$$x > 8 \quad \text{Cheaper after 9 sessions.}$$