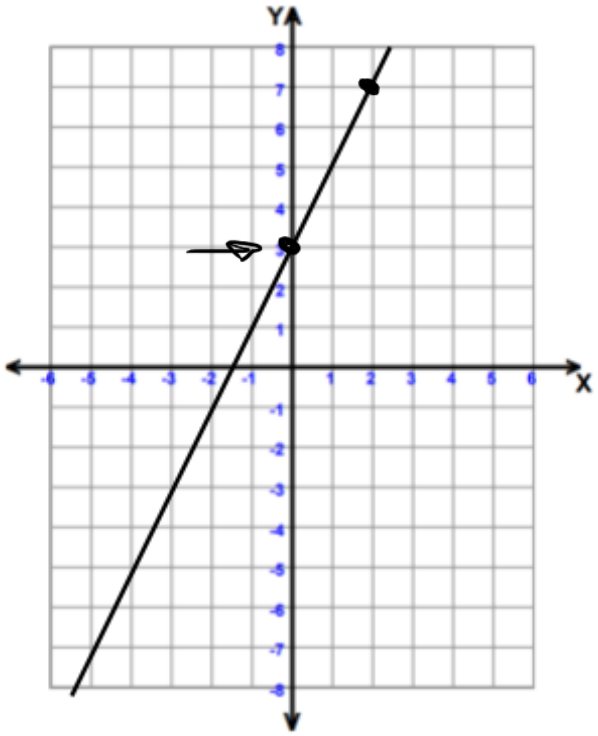
QT Quick Test 4G

Calculator

1. The graph shows part of a straight line.



(a) Write down the y-intercept (1 mark)

+3

$x_1\ y_1$ $(0, 3)$ $\quad$ $x_2\ y_2$ $(2, 7)$

(b) Show that the gradient of the line is +2 (2 marks)

$$\text{gradient} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{7-3}{2-0} = \frac{4}{2} = 2$$

(c) Write down the equation of the line $y = 2x + 3$ (1 mark)

(d) The line continues to the right. Will this line pass through the point (20, 43)? Show how you decide. (2 marks)

$x = 20 \quad y = 43$

$y = 2x + 3$

$43 = 2(20) + 3$

$43 = 43 \quad \therefore$ yes it will through

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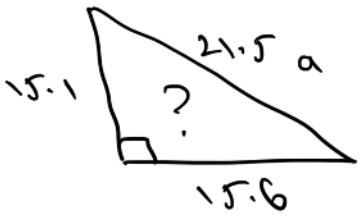
2. A triangle has sides 15.1cm, 15.6cm and 21.5cm. Is this a right angled triangle? Show how you decide. (4 marks)



$a^2 = b^2 + c^2$

$21.5^2 = 15.1^2 + 15.6^2$

$462.25 \neq 471.32$ Not a right angle

3. Solve

(a) $\frac{x}{3} + 2 = 17$ (2 marks)

$-2 \quad -2$

$\frac{x}{3} = 15$

$\times 3 \quad \times 3$

$x = 45$

(b) $x^2 + 15x + 56 = 0$ (2 marks)

$(x + 7)(x + 8) = 0$ $\therefore x = -7$ $x = -8$

4. The scale on a map is 1 : 30000. How many kilometres on the ground are represented by 6cm on the map? (3 marks)

$\times 6 \quad (1 : 30000) \quad \times 6$

$6 : 180000\text{cm}$

$180,000\text{cm} = 1800\text{m} = 1.8\text{km}$.

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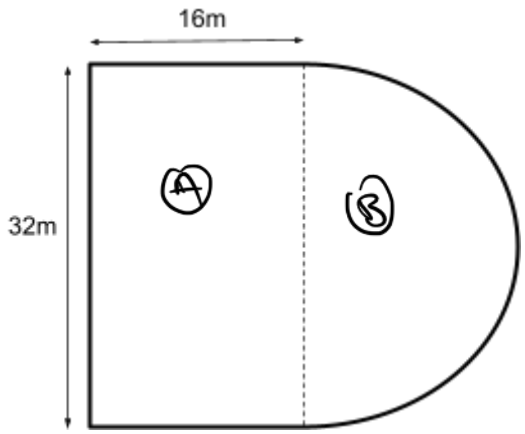
5. Josh is paid £7.60 for the first 25 hours that he works each week. After 25 hours he is paid 1 ½ times the hourly rate. Last week Josh worked for 33 hours. Work out how much Josh earned in total last week. (3 marks)

First 25 hours = $25 \times 7.60 = 190$

8 hours = $8 \times (7.60 \times 1.5) = 91.20$

Total wage = £281.20

6. The diagram shows Carrie's lawn. It is in the shape of a rectangle 32m x 16m, and a semicircle. Carrie is going to build a perimeter fence around the lawn. She calculates the fence will cost £17.50 per metre. Carrie has a budget of £2000.
Will Carrie have enough money to build the perimeter fence? (4 marks)



(A) Perimeter $16 + 32 + 16$

$= 64$ m

(B) Perimeter $= \frac{1}{2} \pi D$

$= \frac{1}{2} \times \pi \times 32 = 50.265$ m (5 m)

Total 115×17.50

$= £2012.50$

No, Carrie needs £12.50 more

7. Lauren invests £4000 for 5 years, in an account offering a compound interest rate of 2.5%. Work out the value of Lauren's investment at the end of 5 years. (3 marks)

Total = original × multiplier^5

$= 4000 \times 1.025^5$

$= £4525.63$

102.5% $= 1.025$

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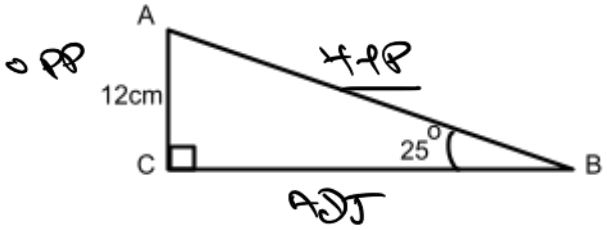
8. ABC is a right angled triangle. Calculate the length AB, giving your answer correct to 3 significant figures. (2 marks)



SohCahToa

$\sin 25^\circ = \frac{12}{HYP}$

$\times HYP \quad HYP \times \sin 25 = 12$

$\div \sin 25 \quad HYP = \frac{12}{\sin 25} = 28.3944$

$= 28.4$ cm (3sf)

9. Convert $8m^3$ into litres (2 marks)

$1000 cm^3 = 1$ Litre

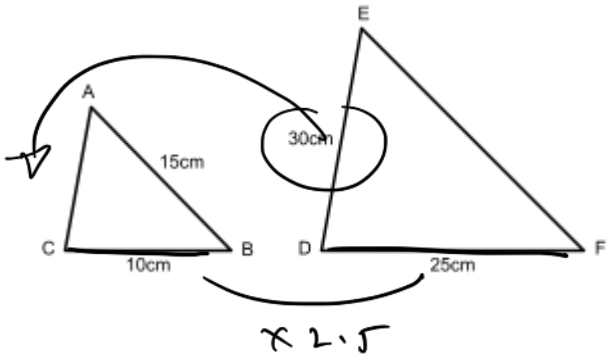
$8000000 cm^3$

$= 8000$ Litres.

10. Two triangles ABC and DEF are mathematically similar.

(a) Work out the length EF. (2 marks)

(b) Work out the length AC. (2 marks)



$EF = AB \times 2.5$

$= 37.5$ cm.

$AC = ED \div 2.5$

$= 12$ cm

(/ 35 marks)