S1 Mathematics Level E Course

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Mr. Lafferty	7/14/2009	S1 Level E NEED TO KNOW

Solving Equations (Balancing Method)

For balance we have

Subtract 6 from each side: $5a + 6 = 3a + 16$ (−6, −6)

Subtract 3a from each side: $5a = 3a + 10$ (−3a, −3a)

Divide each side by 2: $2a = 10$

$a = 5$ ✓

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The Circle

Main parts of the circle

radius $r = \frac{1}{2}D$

Circumference $C = \pi D$

Diameter $D = 2r$

Symmetry

Example : Complete the rest of the shape given the line of symmetry.

The order of symmetry is the number of times a shape looks the same in one complete turn.

Has order 2

Has order 3

Has order 4

Quadrilaterals

Definition : Quadrilateral is " A closed 4 sided linear shape"

A few types of special quadrilaterals

Square, Rectangle, Kite, Rhombus, Parallelogram, Trapezium

Time

When working out time difference we will use the Counting Method. This method will always work.

Example : Find the time difference between 08 46 hrs and 11 52 hrs

08 46	nearest hour ⇨	09 00
09 00	hours ⇨	11 00
11 00	What's left ⇨	11 52

Hrs	Mins
	14
2	
+	52
2	66

60 mins = 1hr

3 hrs 6 mins

Linear Patterns

Number of Tables	1	2	3	4	5
Number of Surfers	5	7	9	11	13

2 2 2 2

Step 1 : Find difference — Same difference linear pattern

Step 2 : Part of the Formula $S = 2T$ — Find a number so formula works

Step 3 : Correction factor "add on 2" $S = 2T + 3$

Ratio

Example : The ratio of boys to girls is 4:5. If there are 16 boys, how many girls are there.

boys	girls
4	5
×4 16	20 ×4

Angles

120° 95° 145°

Angles round a point Add up to 360°

115° 65°

Two angles making a straight line add to 180°

146° 34° 34° 146°

angles opposite each other at a cross are equal.

50° 90° 40°

3 angles in a triangle ALWAYS add up to 180°.

Scale Drawings

Scale Drawings

Solution Using a scale of 1cm = 2m

Step 1: Draw line XY=3cm

Step 2: Draw a line straight up from Y.

Step 3: Measure angle 55° from X.

Step 4: Draw line from X to vertical line and mark T at crossover point.

Step 5: Measure length YT. 4.3cm

Step 6: Multiply length YT. by scale factor.

4.3 x 2 = 8.6m

Flag pole is 8.6m high

Fractions Decimals Percentages

Fractions, Decimals and Percentages

$\frac{1}{10}$ $\frac{2}{10}$ $\frac{3}{10}$ $\frac{4}{10}$ $\frac{5}{10}$ $\frac{6}{10}$ $\frac{7}{10}$ $\frac{8}{10}$ $\frac{9}{10}$

$\frac{1}{2}$

0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1

$\frac{1}{2}$

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Just different ways of saying the same thing.

Length Perimeter Area

Kilometres (km) ×1000 ÷1000

metres (m) ×100 ÷100

centimetres (cm) ×10 ÷10

millimetres (mm)

Surface Area

Example

Find the surface area of the cuboid

4cm, 3cm, 5cm

Front and back are the same

Top and bottom are the same

Right and left are the same

Working

Front Area = l x b = 5 x 4 = 20cm²

Top Area = l x b = 5 x 3 = 15cm²

Side Area = l x b = 3 x 4 = 12cm²

Total Area

= 20+20+15+15+12+12

= 94cm²

Volume

Heilander's Porridge Oats

5cm, 18 cm, 27cm

Working

Volume = l x b x h

V = 18 x 5 x 27

V = 2430 cm³

Calculate the area of this shape

12cm, 6cm

$A = \frac{1}{2}bh$

$A = \frac{1}{2} \times 6 \times 12$

$A = 36cm^2$

Calculate the area of this shape

16cm, 5cm, 5cm, 6cm

Rectangle 1

A = l x b

A = 16 x 5

A = 80cm²

Rectangle 2

A = l x b

A = 6 x 5

A = 30cm²

Total Area = 80 + 30 = 110cm²

Problem

Below is a draw of the school building. Calculate the perimeter.

x m, 4 m, 9 m, 8 m, 4 m, 12 m

x = 12 - 9 = 3 m

Perimeter

= 12 + 8 + 3 + 4 + 9 + 4

= 40 m