

## Q1

To find a reverse bearing, either add or subtract  $180^\circ$  (whichever will give an answer between  $0^\circ$  and  $360^\circ$ ).

$$50 + 180$$

 **230°**

## Q2

To find a reverse bearing, either add or subtract  $180^\circ$  (whichever will give an answer between  $0^\circ$  and  $360^\circ$ ).

$$330 - 180 = 150$$

 **150°**

2b

First find the time for the flight in hours.

Time = Distance  $\div$  Speed.

$$200 \div 120 = \frac{200}{120} = \frac{20}{12} = \frac{10}{6} = \frac{5}{3} = 1\frac{2}{3} \text{ hours}$$

Next convert  $\frac{2}{3}$  of an hour to minutes.

There are 60 minutes in an hour, so multiply 60 by  $\frac{2}{3}$ .

$$60 \times \frac{2}{3} = 40$$

$$\frac{2}{3} \text{ hours} = 40 \text{ minutes}$$

This allows you to give the flight time in hours and minutes.

$$1\frac{2}{3} \text{ hours} = 1 \text{ hour } 40 \text{ minutes}$$

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$$1\frac{2}{3} \text{ hours} = 1 \text{ hour } 40 \text{ minutes}$$

Now just add 1h 40m onto 10am to find the answer.

 **11.40 am**

*1140 (the 24 hour clock version) will also get the mark here.*

## Q3-4

To find a reverse bearing, either add or subtract  $180^\circ$  (whichever will give an answer between  $0^\circ$  and  $360^\circ$ ).

$$65 + 180$$

 **245°**

4

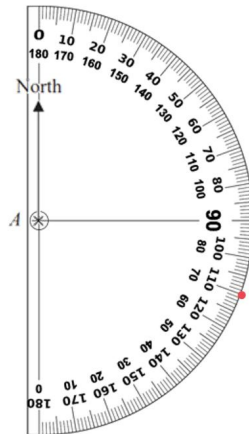
To find a reverse bearing, either add or subtract  $180^\circ$  (whichever will give an answer between  $0^\circ$  and  $360^\circ$ ).

$$149 + 180$$

 **329°**

## Q5

Put the centre of a protractor on the point A. Rotate the protractor so that 0° lies on the North line. Starting at 0° follow the numbers around until you read 110° and put a dot.



[1]

Use the scale to find the distance of C from A on the map. 1 cm represents 200 m.

$$700 \div 200 = 3.5$$

$$1 \text{ cm} \times 3.5 = 3.5 \text{ cm}$$

[1]

Put the 0 cm on the ruler at point A on the map. Line up the ruler so that it passes through the dot. Measure 2.5 cm from A. Put a cross and label it C.

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\* C

[1]

5b

The scale is 1 cm : 200 m. Make both parts have the same units by converting 200 m to centimetres.

$$200 \times 100 \text{ cm} = 20\,000 \text{ cm}$$

The scale is now 1 cm : 20 000 cm. You can now remove the units as they are the same.

1 : 20000 [1]

Q6-8

The length of the hypotenuse of a triangle must be less than the sum of the lengths of the two shorter sides.

$$17 + 13 = 30$$

**AB cannot be 35 m as it must be less than 30 m [1]**

7

To find a reverse bearing, either add or subtract  $180^\circ$  (whichever will give an answer between  $0^\circ$  and  $360^\circ$ ).

$$310 - 180$$

**$130^\circ$  [1]**

8

To find the bearing start at the north line from A and measure clockwise until you reach C. Add together the two angles.

$$130 + 80 = 210$$

**$210^\circ$  [1]**

### Q9

Find the length of the triangle for the drawing using the scale. 1 cm represents 2 m. Therefore divide 16 m by 2 to find how many centimetres are needed for the scale drawing.

$$16 \div 2 = 8 \text{ cm}$$

Draw a straight line with length 8 cm.

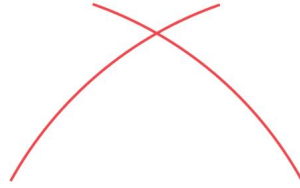


*Drawing an 8 cm line [1]*

Open your pair of compasses to 8 cm. Put the point on one end of the line and draw an arc above the line that goes above the middle of the line.

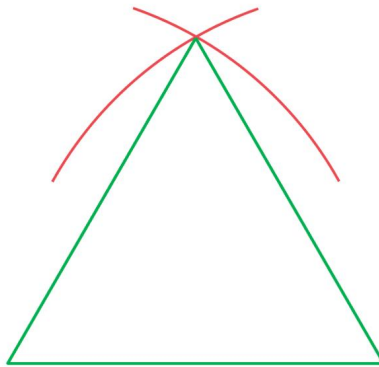


Keeping the width of the compass at 8 cm, do the same at the other end of the line. The two arcs should intersect.



[1]

Form the equilateral triangle by drawing lines from the intersection of the two arcs to each of the ends of the straight line.



[1]

The lengths of the sides need to be within 2 mm of 8 cm

Q10

- i) Use the map and real life measurements for Packer Street to write the scale for the map.

$$3.5 \text{ cm represents } 180 \text{ m}$$

Divide the real life measurement by the map measurement to find how many real life metres is represented by a centimetre on the map.

$$180 \div 3.5 = 51.4285\dots$$

$$1 \text{ cm represents } 51.4285\dots \text{ m}$$

[1]

Multiply by the map measurement for High Street. Use the answer button or type the calculation in as a single calculation.

$$180 \div 3.5 \times 11.2$$

[1]

$$= 576$$

**The real life measurement for High Street is 576 m** [1]

- ii) If the map measurement is higher than 3.5 cm then each cm on the map will represent fewer metres as 180 will be divided by a bigger number.

Jodie's reasoning is **incorrect** as 1 cm will represent a **smaller distance in real life** therefore High Street will be **shorter than 576 m**

*Correct explanation* [1]

*Stating that the reasoning is incorrect* [1]

It is acceptable to choose a measurement bigger than 3.5 cm and showing that the real life length is less than 576 m

10b

The distance on the map is 2.4 cm and the distance in real life is 180 m. Convert the 180 m into cm by multiplying by 100.

$$180 \text{ m} = 180 \times 100 \text{ cm} = 18000 \text{ cm}$$

Now the units are the same you can write as a ratio without the units.

$$2.4 : 18000$$

Now the units are the same you can write as a ratio without the units.

$$2.4 : 18000$$

To make the first part of the ratio 1, you need to divide both sides by 2.4.

$$1 : \frac{18000}{2.4}$$

[1]

**1 : 7500** [1]

## Q11-12

Find the distance for a full-size train by multiplying by 87. This will give the distance in millimetres.

$$16.5 \text{ mm} \times 87 = 1435.5 \text{ mm}$$

[1]

Convert to metres. 1 cm = 10 mm and 1 m = 100 cm so divide by 10 and then by 100.

$$1435.5 \div 10 \div 100 = 1.4355$$

**1.4355 metres** [1]

It is acceptable to round to 1.436 or 1.44

12

- i) 1 cm represents 25 m. To find out how many centimetres represent 240 m, you need to see how many times 25 goes into 240.

$$240 \div 25 = 9.6$$

**9.6 cm** [1]

- ii) To find the ratio you need to write both in the same units. 1 m = 100 cm so convert 25 m into cm by multiplying by 100.

$$25 \times 100 = 2500$$

Now they are in the same units you can write as a ratio.

$$1 : 2500$$

**k = 2500** [1]