Grange Academy
Applications
Unit 3 Assessment Practice

Calculators allowed

1. Jamie's paper run covers the area inside the triangle formed between Grange Academy, Rugby Park and Howard House (shown on the map below). Calculate the area he covers, giving your answer to the nearest square metre. **(2)**
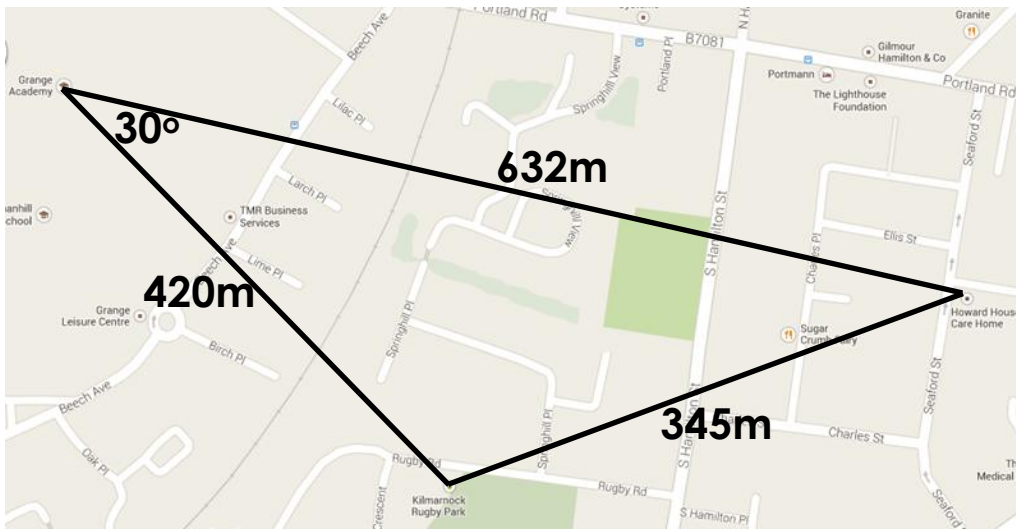
2. In a football training session, Kevin passes the ball 16metres to Chris who plays a 17metres pass at angle of 35° to Tommy who tries to score a goal. How far apart are Kevin and Tommy? **(4)**
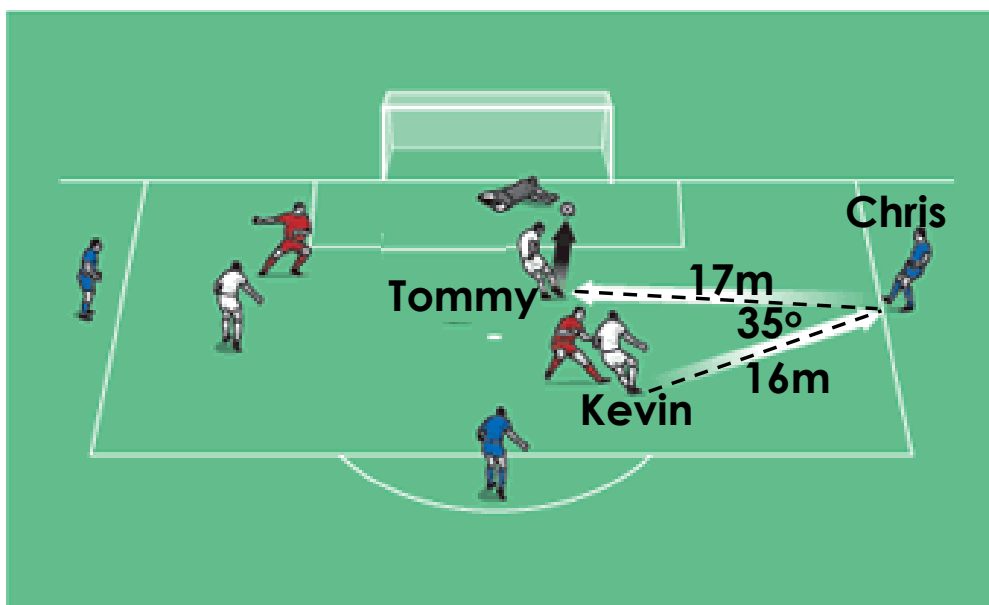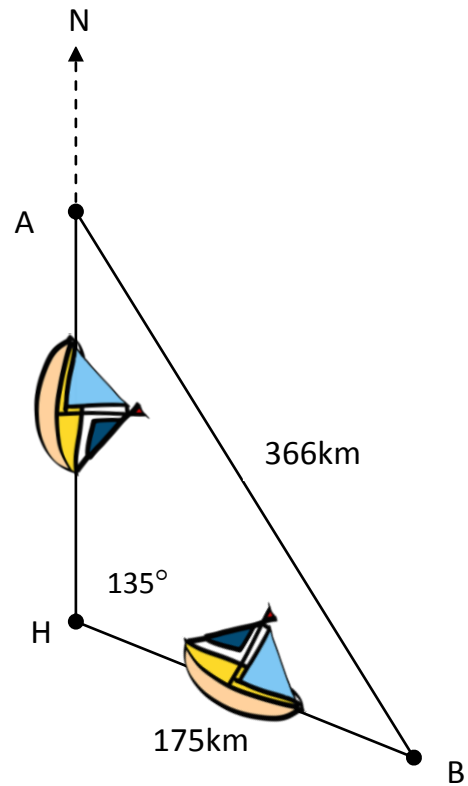
3. Ship A leaves the harbour (H) and travels   North.

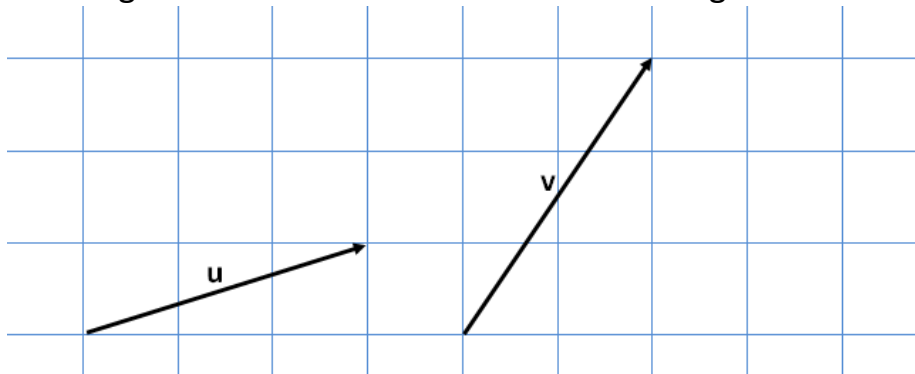Ship B leaves the harbour on a bearing of 135° and travels 175km.

When the ships are 366km apart, calculate the bearing of ship B from Ship A.

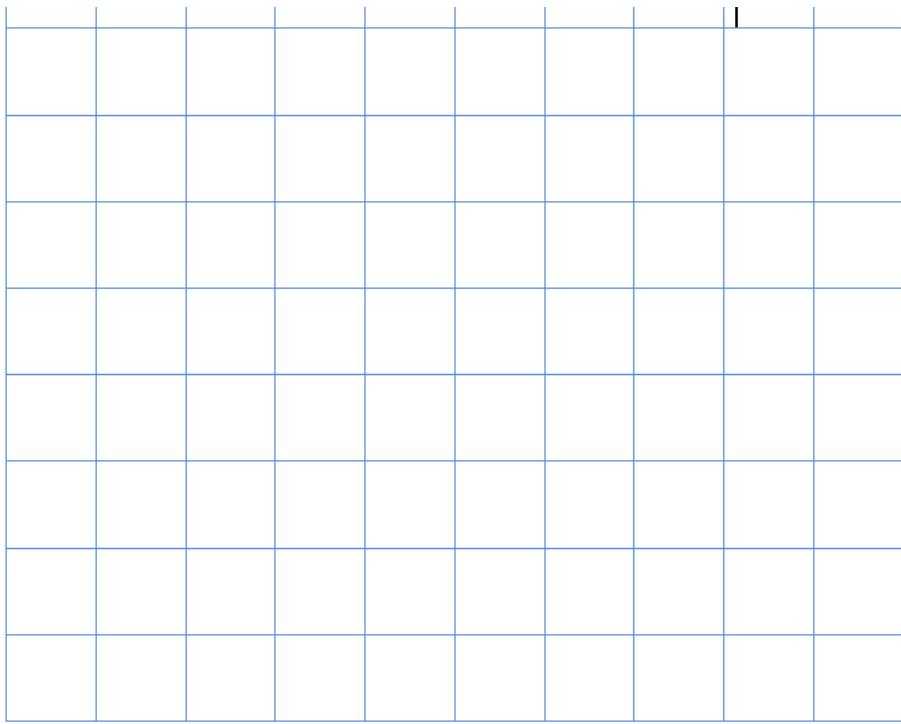Give your answer to the nearest degree.

(2)
#1

N

A

366km

135°

H

175km

B

4. The diagrams below show two directed line segments **u** and **v**.

(3)

v

u

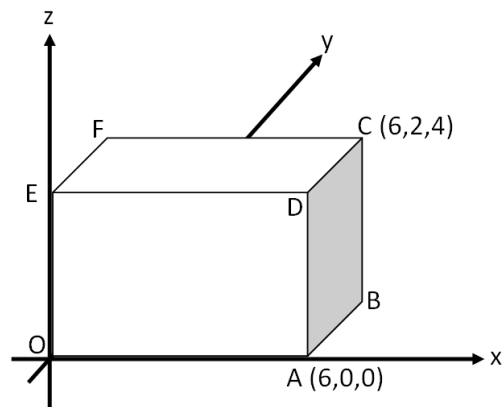Draw the resultant of 3**u** + **v** .

5. The diagram shows a cuboid ABCDEFGO.

The coordinates of A are (6,0,0) and C are (6,2,4).

Write down the coordinates of F.

(1)

6. The forces acting on a body are represented by three vectors **u**, **v** and **w** as given below.

$$\mathbf{u} = \begin{pmatrix} 7 \\ -2 \\ 3 \end{pmatrix}, \ \mathbf{v} = \begin{pmatrix} 4.5 \\ 2.5 \\ -1.5 \end{pmatrix}, \ \mathbf{w} = \begin{pmatrix} 0 \\ 3 \\ -2 \end{pmatrix}.$$

(2)

Find the resultant force.

7. Vector $\mathbf{p} = \begin{pmatrix} 3 \\ 1 \end{pmatrix}$ and vector $\mathbf{q} = \begin{pmatrix} 4 \\ -2 \end{pmatrix}$.

Calculate $\left| 5\mathbf{p} + 2\mathbf{q} \right|$.

(3)

8. Mr Smith buys an antique calculator for £160. Its value increased by 12% each year.

(3)

Find the value of the antique calculator after 3 years.

9. The US state of Colorado is almost rectangular in shape.

Its width is $\dfrac{153}{250}$ Megametres.

Its length is $\dfrac{9}{20}$ Megametres.

(2)

Assuming it is a rectangle, calculate the exact area of Colorado (in Mm^2).

10.

Heidi's height has increased by 16% since last year.

She is now 126cm.

Find Heidi's height **last year**.

(2)
#1

11. The high scores of an S1 class at Flappy Bird were recorded:

43, 27, 6, 71, 18, 15

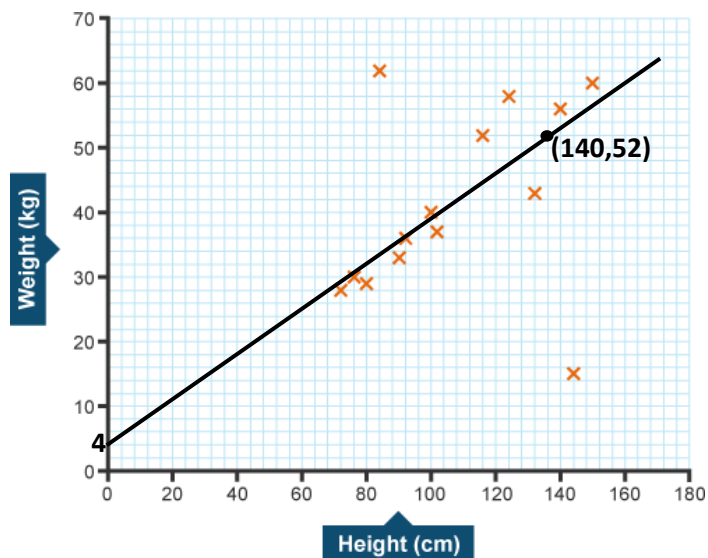**a.** Find the mean and standard deviation of the scores of this class. **(4)**

b. An S3 class has a mean score of 35 with a standard deviation of 1.6. Make two valid comparisons between the S1 and S3 classes. **#1**

12. The weights (W) and heights (H) of a group of friends is recorded and presented in a scattergraph.

The line of best fit is also shown.

a. Determine the gradient and the *y*-intercept of the line of best fit. (3)

b. Hence write down the equation of this line in terms of H and W. (1)

c. Use your equation to estimate the weight of someone who is 210cm tall. #1

END OF ASSESSMENT