THIRD SPACE LEARNING

GCSE Exam Questions

Trigonometry | Geometry & Measure

GCSE Exam Questions: Trigonometry

1) **(a)** Agatha and Beatrice set off from the same point at the same time. Agatha walks at a bearing of 120° at 5*kmph*. Beatrice walks at a bearing of 200° at a speed of 4.8*kmph*. Calculate the distance between them after 30 minutes. Write your answer correct to 2 decimal places.

(5)

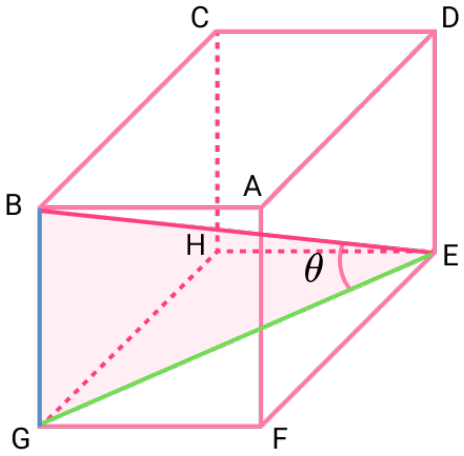
(b) Use your answer to part a) to calculate the bearing of Beatrice from Agatha at this time.

(4)

(9 marks)

GCSE Exam Questions: Trigonometry

2) **(a)** A cube shown below has a surface area of 36cm². Calculate the length of the line *BE*. Write your answer in the form $a\sqrt{b}$ where a and b are prime numbers.



(4)

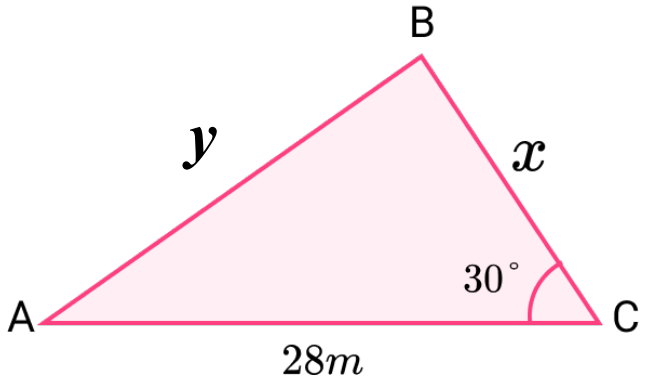
(b) Calculate the size of angle *BEG*.

(3)

(7 marks)

GCSE Exam Questions: Trigonometry

3) **(a)** Triangle ABC has an area of $105m^2$. Calculate the length of x.



(2)

(b) Calculate the value of y correct to 2 decimal places.

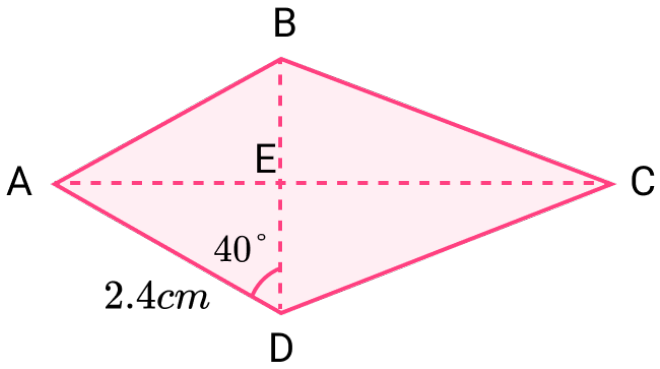
(3)

(8 marks)

GCSE Exam Questions: Trigonometry

4) **(a)** $ABCD$ is a kite with the following information:

- $AD = 2.4cm$,
- Angle $ADE = 40°$,
- E is the intersection point of the two diagonals AC and
- $AE:EC = 2:3$.



Calculate the length of the line AC. Write your answer correct to 2 decimal places.

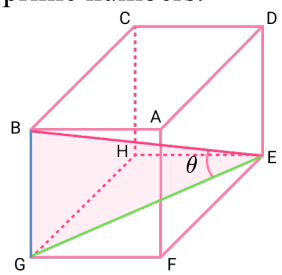
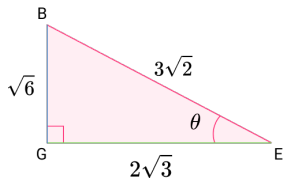
(3)

(b) Calculate the area of ABD.

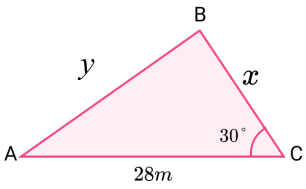
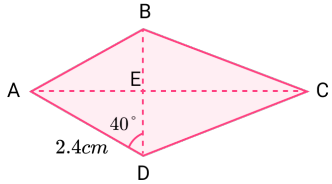
(3)

(6 marks)

GCSE Exam Questions: Trigonometry Answers

	Question	Answer	Marks
1) (a)	Agatha and Beatrice set off from the same point at the same time. Agatha walks at a bearing of 120° at 5*kmph*. Beatrice walks at a bearing of 200° at a speed of 4.8*kmph*. Calculate the distance between them after 30 minutes. Write your answer correct to 2 decimal places.	$4.8 \times 0.5 = 2.4km$ $5 \times 0.5 = 2.5km$ $200 - 120 = 80°$ Substitution into the cosine rule: $a^2 = 2.4^2 + 2.5^2 - 2 \times 2.4 \times 2.5 \cos(80)$ $a^2 = 9.926221868$ $a = 3.15km$ (2dp)	**(1)** **(1)** **(1)** **(1)** **(1)**
(b)	Use your answer to part a) to calculate the bearing of Beatrice from Agatha at this time.	$\frac{sin(\theta)}{2.4} = \frac{sin(80)}{3.15059...}$ $(\frac{2.4sin(80)}{3.15059...})$ $\theta = \sin^{-1}$ $\theta = 48.606...°$ Bearing of B from A = 360 - (60 + 48.606..) = 251°	**(1)** **(1)** **(1)** **(1)**
2) (a)	A cube shown below has a surface area of $36cm^2$. Calculate the length of the line BE. Write your answer in the form $a\sqrt{b}$ where a and b are prime numbers.  	$6x^2 = 36$ $x = \sqrt{6}$ $BE = \sqrt{(\sqrt{6})^2 + (\sqrt{6})^2 + (\sqrt{6})^2} = \sqrt{18}$ $BE = 3\sqrt{2}$	**(1)** **(1)** **(1)** **(1)**
(b)	Calculate the size of angle BEG.	 or $BG = \sqrt{6}$ and $EG = 2\sqrt{3}$ $\theta = \tan^{-1}(\frac{\sqrt{6}}{2\sqrt{3}})$ $\theta = 35.26°$ (2dp)	 **(1)** **(1)** **(1)**

GCSE Exam Questions: Trigonometry Answers

	Question	Answer	Marks
3) (a)	Triangle ABC has an area of $105m^2$. Calculate the length of x.  	$\frac{1}{2} \times 28 \times x \times \sin(30) = 105$ $7x = 105$ $x = 15m$	**(1)** **(1)**
(b)	Calculate the value of y correct to 2 decimal places.	$y^2 = 15^2 + 28^2 - 2 \times 15 \times 28 \times \cos(30)$ $y^2 = 281.5386608$ $y = 16.78m$ $(2dp)$	**(1)** **(1)** **(1)**
4) (a)	$ABCD$ is a kite with the following information: • $AD = 2.4$cm, • Angle $ADE = 40^o$, • E is the intersection point of the two diagonals AC and BD • AE:EC = 2:3.  Calculate the length of the line AC. Write your answer correct to 2 decimal places.	$AE = 2.4 \sin(40)$ $AE = 1.542690263$ $AC = 1.54... \times \frac{5}{2} = 3.86cm$ $(2dp)$	**(1)** **(1)** **(1)**
(b)	Calculate the area of ABD.	Angle BAD =180 - (40 + 40) = 100^o $A = \frac{1}{2} \times 2.4 \times 2.4 \times sin(100)$ $A = 2.84cm^2$	**(1)** **(1)** **(1)**

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