

After Test Assignment

Maximum marks will be given for correct answers. Where an answer is incorrect, some marks may be given for a correct method, provided this is shown by written working. Answers must be written within the answer boxes provided. Solutions found from a graphic display calculator should be supported by suitable working, for example, if graphs are used to find a solution, you should sketch these as part of your answer.

1. A calculator fits into a cuboid case with height 29 mm, width 98 mm and length 186 mm.
 - (a) Find the volume, in mm^3 , of this calculator case. Give your answer to two significant figures. [2]
 - (b) Write down your answer to part (a) in the form $a \times 10^k$ where $1 \leq a < 10$ and $k \in \mathbb{Z}$. [2]
 - (c) Find the volume, in cm^3 , of this calculator case. [2]

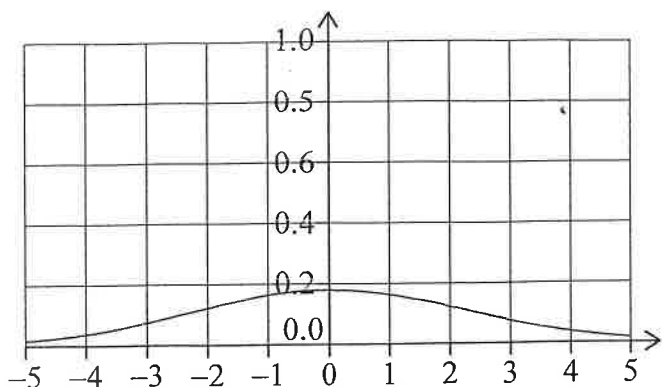
Working:

Answers:

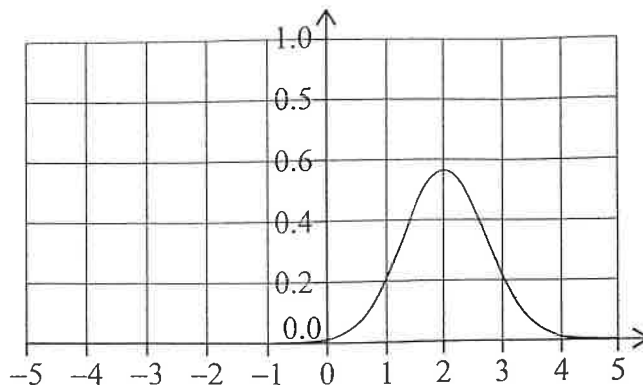
- (a)
- (b)
- (c)

11. Consider the following graphs of normal distributions.

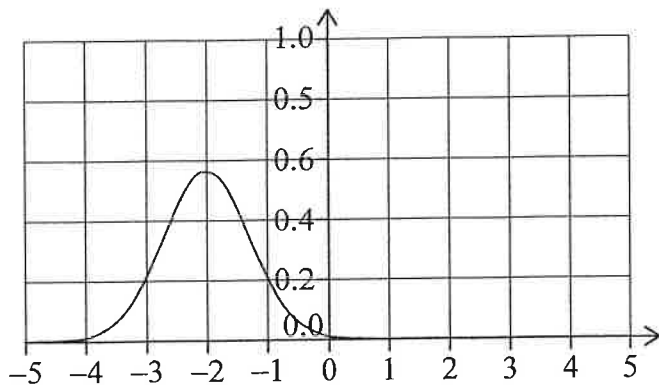
Graph A



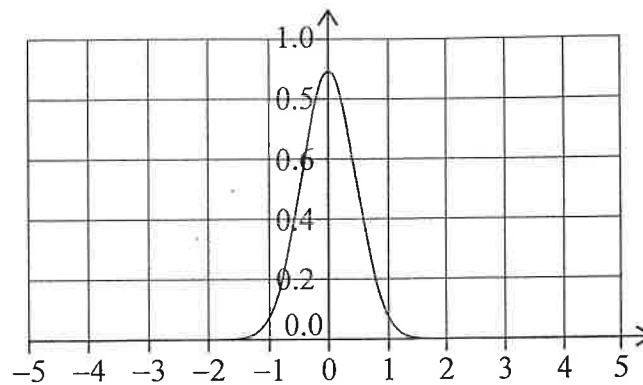
Graph B



Graph C



Graph D



- (a) In the following table, write down the letter of the corresponding graph next to the given mean and standard deviation. [2]

Mean and standard deviation	Graph
Mean = -2; standard deviation = 0.707	
Mean = 0; standard deviation = 0.447	

At an airport, the weights of suitcases (in kg) were measured. The weights are normally distributed with a mean of 20 kg and standard deviation of 3.5 kg.

- (b) Find the probability that a suitcase weighs less than 15 kg. [2]

Any suitcase that weighs more than k kg is identified as excess baggage. 19.6% of the suitcases at this airport are identified as excess baggage.

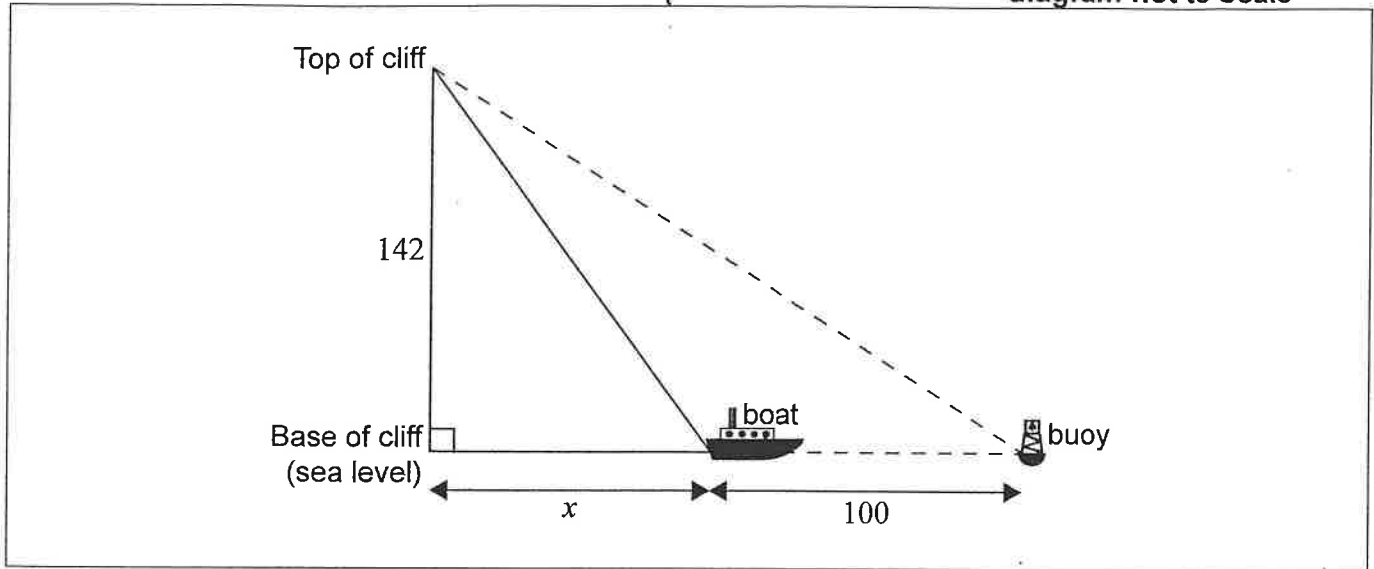
- (c) Find the value of k . [2]

(This question continues on the following page)

8. A buoy is floating in the sea and can be seen from the top of a vertical cliff. A boat is travelling from the base of the cliff directly towards the buoy.

The top of the cliff is 142 m above sea level. Currently the boat is 100 metres from the buoy and the angle of depression from the top of the cliff to the boat is 64° .

diagram not to scale



- (a) Draw and label the angle of depression on the diagram. [1]
- (b) Find x , the horizontal distance currently between the base of the cliff and the boat. [2]
- (c) Find the distance from the **top of the cliff** to the buoy. [3]

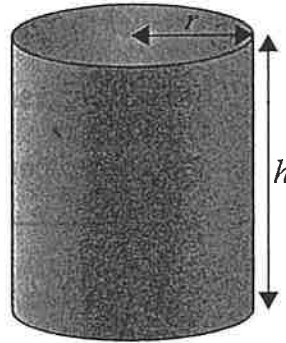
Working:

Answers:

- (b)
- (c)

15. A cylinder with radius r and height h is shown in the following diagram.

diagram not to scale



The sum of r and h for this cylinder is 12 cm.

- (a) Write down an equation for the area, A , of the **curved** surface in terms of r . [2]
- (b) Find $\frac{dA}{dr}$. [2]
- (c) Find the value of r when the area of the curved surface is maximized. [2]

Working:

Answers:

- (a)
- (b)
- (c)