

Calculator Overlap questions November 2017 Paper 21/16 Solve $5x - 6 = 3(x - 1)$

$$5x - 6 = 3x - 3$$

$$2x - 6 = -3$$

$$2x = 3$$

$$x = \frac{3}{2}$$

$$x = \frac{3}{2} \dots\dots\dots (3)$$

2/17 Emily buys a pack of 12 bottles of water.

The pack costs £5.64

Emily sells all 12 bottles for 50p each.

Work out Emily's percentage profit.

Give your answer correct to 1 decimal place.

$$\text{money made} = 0.50 \times 12 = \pounds 6$$

$$\text{profit made} = 6 - 5.64 = \pounds 0.36$$

$$\% \text{ profit} = \frac{\text{profit}}{\text{cost}} \times 100$$

$$= \frac{0.36}{5.64}$$

$$= 6.382978723$$

$$\dots\dots\dots 6.4 \dots\dots\dots \% (3)$$

8/23 Use your calculator to work out

$$\sqrt{\frac{\sin 25^\circ + \sin 40^\circ}{\cos 25^\circ - \cos 40^\circ}}$$

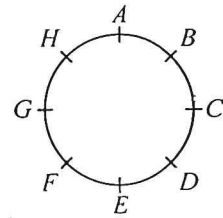
(a) Write down all the figures on your calculator display.

$$\dots\dots\dots \boxed{2.75603957} \dots\dots\dots (2)$$

(b) Write your answer to part (a) correct to 2 decimal places.

$$\dots\dots\dots 2.76 \dots\dots\dots (1)$$

3/18 Hasmeet walks once round a circle with diameter 80 metres.



There are 8 points equally spaced on the circumference of the circle.

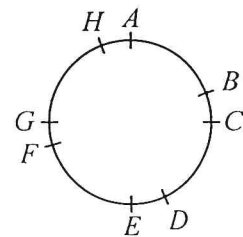
(a) Find the distance Hasmeet walks between one point and the next point.

$$C = \pi d = \pi \times 80$$

$$\text{distance} = \frac{8\pi}{8} = \pi =$$

3.14 (2 dp) m
(2)

Four of the points are moved, as shown in the diagram below.



Hasmeet walks once round the circle again.

(b) Has the mean distance that Hasmeet walks between one point and the next point changed? You must give a reason for your answer.

mean = $\frac{\text{total dist}}{8}$ this is the same as the distance is the same
(1)

4/19 There are only blue cubes, yellow cubes and green cubes in a bag. There are

twice as many blue cubes as yellow cubes and four times as many green cubes as blue cubes.

Hannah takes at random a cube from the bag.

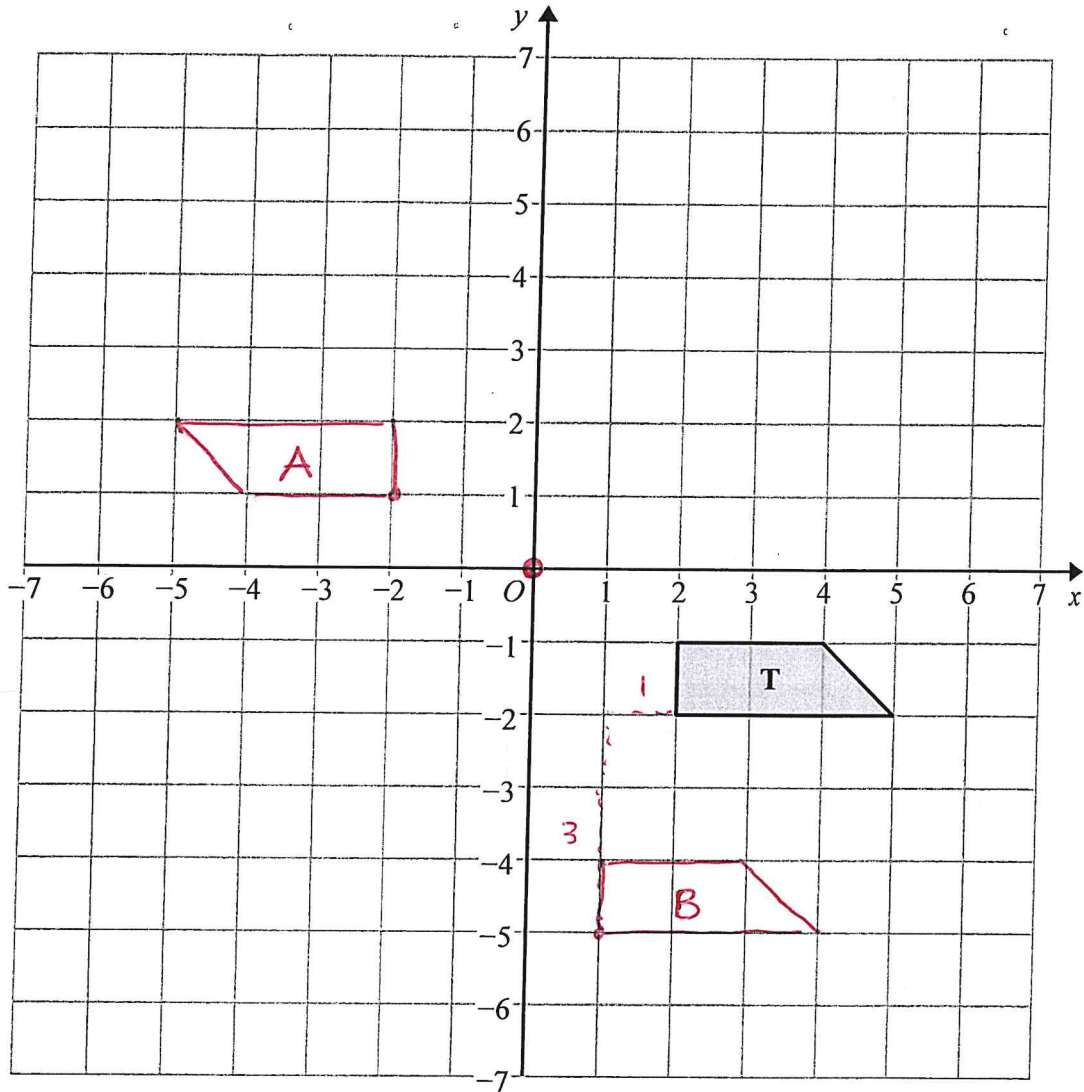
Work out the probability that Hannah takes a yellow cube.

$$\begin{array}{l} B : Y : G \quad \text{Total} \\ 2 : 1 : 8 \quad \quad 11 \end{array}$$

$$P(\text{yellow}) = \frac{1}{11}$$

$\frac{1}{11}$

(Total 3 marks)



(a) Rotate trapezium **T** 180° about the origin.
Label the new trapezium **A**.

(1)

(b) Translate trapezium **T** by the vector $\begin{pmatrix} -1 \\ -3 \end{pmatrix}$ \leftarrow
 \downarrow

Label the new trapezium **B**.

(1)

6/21 $p^3 \times p^x = p^9$

(a) Find the value of x .

$$3 + x = 9$$

$$x = 6$$

$x = \dots 6 \dots$

(1)

$(7^2)^y = 7^{10}$

(b) Find the value of y .

$$2 \times y = 10$$

$$y = 5$$

$y = \dots 5 \dots$

(1)

$100^a \times 1000^b$ can be written in the form 10^w

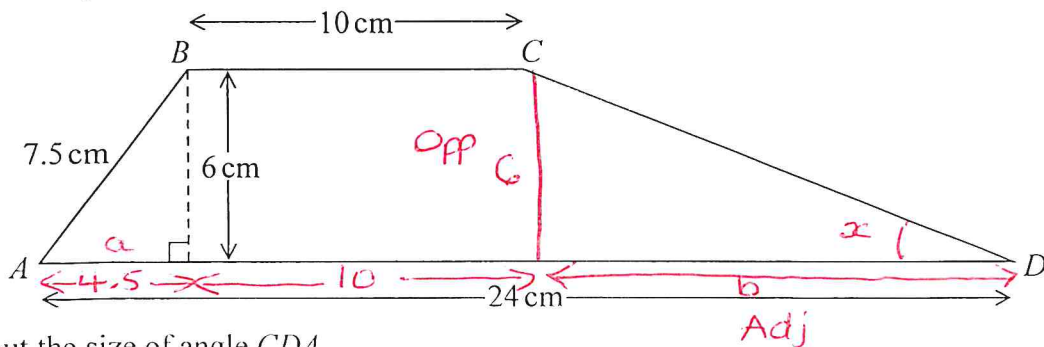
(c) Show that $w = 2a + 3b$

$$\begin{aligned} & 100^a \times 1000^b \\ &= (10^2)^a \times (10^3)^b \\ &= 10^{2a} \times 10^{3b} \\ &= 10^{2a+3b} \end{aligned}$$

use laws of indices

(2)

7/22 ABCD is a trapezium.



Work out the size of angle CDA.

Give your answer correct to 1 decimal place.

By Pythag

$$\begin{aligned} c^2 &= a^2 + b^2 \\ 7.5^2 &= a^2 + 6^2 \\ 56.25 &= a^2 + 36 \\ a^2 &= 20.25 \\ a &= \sqrt{20.25} \\ a &= 4.5 \end{aligned}$$

$$\begin{aligned} b &= 24 - 10 - 4.5 \\ b &= 9.5 \end{aligned}$$

$$\tan x = \frac{O}{A}$$

$$\tan x = \frac{6}{9.5}$$

$$x = \tan^{-1}\left(\frac{6}{9.5}\right)$$

$$x = \underline{32.27564431}$$

32.3

(5)

TOTAL FOR PAPER IS 26 MARKS