Alleyn's

13+ MATHS

SAMPLE EXAMINATION PAPER 1

Calculators MAY NOT be used for Sections A or B.

You may use your calculator for Section C.

One hour.

Co-educational

excellence

SECTION A

MULTIPLE CHOICE – Circle the letter of the answer that is correct.
DO NOT USE YOUR CALCULATOR.

1. How much larger is the 9 than the 5 in the number 690753?

A 8950 **B** 90050 **C** 8995 **D** 89950 **E** 89500

2. $3 + 4 \times 5 - 1 =$

A 34 **B** 28 **C** 19 **D** 22 **E** 24

3. Estimate the value of $\frac{584.3+43.27}{5.24\times22.64}$

A 50 **B** 25 **C** 20 **D** 10 **E** 5

4. A regular polygon has interior angles of 162°. How many sides does the polygon have?

A 45 **B** 9 **C** 20 **D** 18 **E** 24

5. How many sides does a heptagon have?

A 6 **B** 7 **C** 8 **D** 9 **E** 10

6. Write the ratio $1.6m : 480cm$ in its simplest form

A 1 : 3 **B** 1.6 : 480 **C** 1 : 300 **D** 40 : 12 **E** 1600 : 480

7. $6 - 2(x - 1)$ simplifies to

A $4x - 4$ **B** $4 - 2x$ **C** $8 - 2x$ **D** $2x + 5$ **E** $2x + 8$

8. Which of these is the same as $\frac{3}{7}$?

A $\frac{13}{17}$ **B** $\frac{1}{2} + \frac{2}{5}$ **C** $\frac{5}{12} - \frac{2}{5}$ **D** $\frac{13}{14} - \frac{1}{2}$ **E** $\frac{33}{70}$

9. What would be the most appropriate units in which to measure the mass of an apple?

A g **B** mg **C** kg **D** m **E** cm

10. The two shorter sides of a *right-angled triangle* are 5cm and 12cm. What is the length of the third side?

A 10.9cm **B** 15cm **C** 169cm **D** 17cm **E** 13cm

SECTION B

SHOW **ALL** YOUR WORKING FOR THESE QUESTIONS.
DO NOT USE YOUR CALCULATOR.

11. Work out:

(a) $576.02 + 34.523$

(b) 36.84×20.3

12. Work out the following, giving your answers in lowest terms:

(a) $5\frac{2}{9} - 2\frac{5}{6}$

(b) $\frac{12}{15} \div \frac{18}{35}$

(c) $1\frac{1}{2} + 2\frac{1}{2} \times 3\frac{4}{5}$

13. (a) $(-4) \times (-5.2) =$

(b) $7 - 2(3 + (-2)) =$

(c) $\frac{(-3)+3\times(-8)}{(-5)+(-1)} =$

(d) $(-11) - (-3) + (-5) =$

YOU **MUST** SHOW FULL WORKING TO ACHIEVE FULL MARKS FOR THIS QUESTION. DO NOT USE YOUR CALCULATOR.

14. (a) Work out 16% of £545.

Answer £……..

(b) A holiday was offered in a 20% discount sale for £1088. What was its cost before the sale?

Answer £……..

SECTION C

YOU **MAY** USE YOUR CALCULATOR FOR THE REST OF THE EXAM.

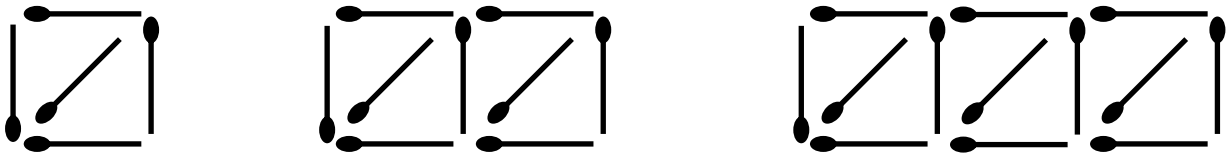
15. Find the next two terms in each sequence, and also the formula for the *n*th term.

(a) 2, 5, 8, 11, ….., ….. *n*th term: ……..

(b) 3, 6, 11, 18, 27 ….., ….. *n*th term: ……..

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16. The following pattern of squares is made out of matchsticks:



(a) The next shape in this pattern is made up of 4 squares. How many matchsticks are needed to make this new 4-square shape?

……..

(b) Let *m* stand for the number of matchsticks and *s* for the number of squares.

Write an equation for *m* in terms of *s*.

m = ……..

(c) How many matches are needed for a pattern with 15 squares?

……..

(d) How many squares can be made using 201 matches?

……..

17. Solve the following equations, showing your working.

(a) $3a - 7 = 20$

(b) $3(3 - 5d) = 45$

(c) $6n - 5 = 4n + 3$

(d) $\frac{2x}{3} + 1 = 11$

(e) $2(3x + 1) = 6 - 4(7 - x)$

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18. Here are the handspans of 13 girls from Year 9, measured in centimetres.

18, 22, 17, 19, 19, 22, 22, 23, 18, 19, 21, 21, 19

(a) What is the mean handspan?

……..

(b) What is the median handspan?

……..

(c) What is the range of the girls' handspans?

……..

19. (a) What is the circumference of a bicycle wheel if the radius is 32 cm? Give your answer correct to 1 decimal place.

……..cm

(b) How many complete revolutions does the wheel make in a journey of 5 km?

……..

(c) If it takes 20 minutes to cycle 8 km, what is the speed in kilometres per hour?

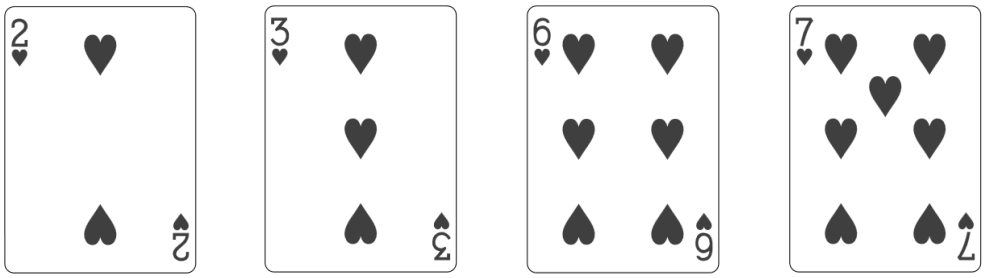
……..km/h

(d) What is this speed in metres per second? Give your answer correct to 2 decimal places.

……..m/s

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20. The following four cards are shuffled and placed face down. Jacob then selects two of the cards randomly.



(a) List all the possible pairs of cards.

……..

……..

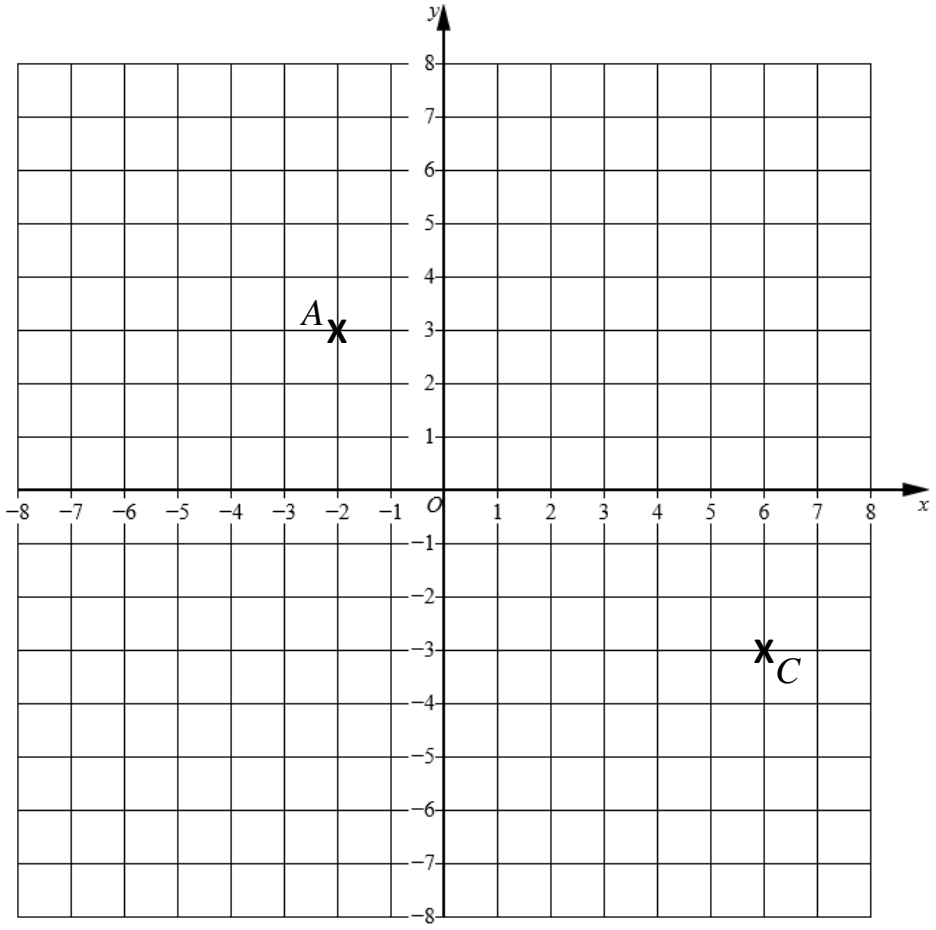
(b) Find the probability that the total for the two cards is 9.

……..

(c) Find P(both even).

……..

21. On the grid below, *A* and *C* are the opposite corners of a square.



(a) On the grid, show points *B* and *D*, the other two corners for the square.

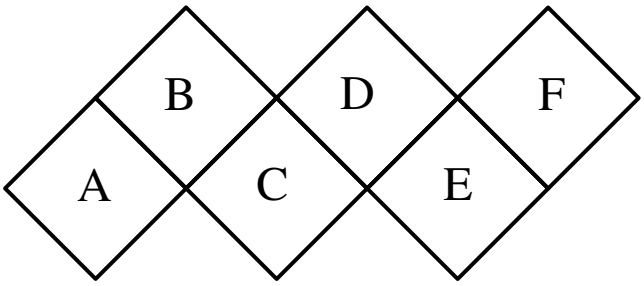
(b) Write down the coordinates for points *B* and *D*.

B (……, ……)

D (……, ……)

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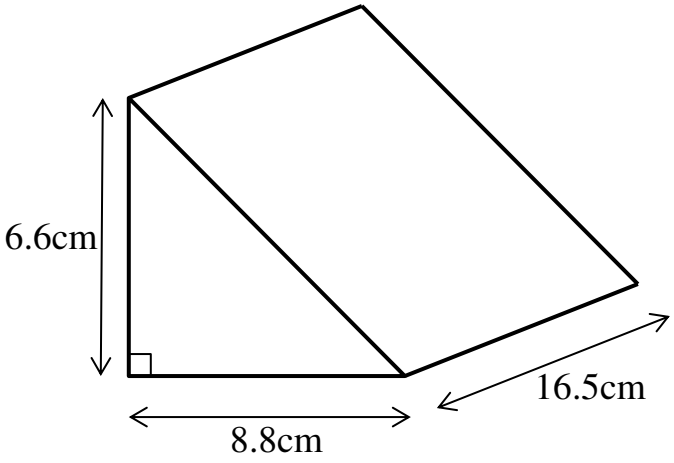
22. Here is a net for a cube.



(a) Which face will be opposite to the one marked *B*? ……

(b) Which face will be opposite to the one marked *C*? ……

23. (a) Calculate the volume of the following prism.



…… cm^3

(b) Calculate the surface area of the prism.

…… cm^2

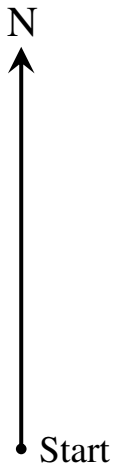
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24. Find the Highest Common Factor (HCF) and Lowest Common Multiple (LCM) for 108 and 630.

HCF = …… LCM = ……

25. A ship sailed 70km on a bearing of 240° and then a further 65km due south.

(a) Using a scale of 1cm to 10km, draw the journey in the space below.



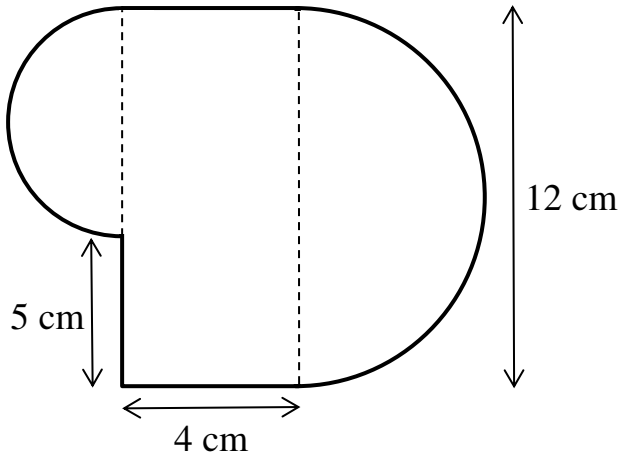
(b) How far is the ship now from the starting point?

……..km

(c) The ship then has to head straight back to the start. Measure the bearing on which it should travel.

……..°

26. The shape shown is formed of two semicircles and a rectangle. Find the perimeter and area for the shape. Give your answers correct to 1 decimal place.



Perimeter ……..cm

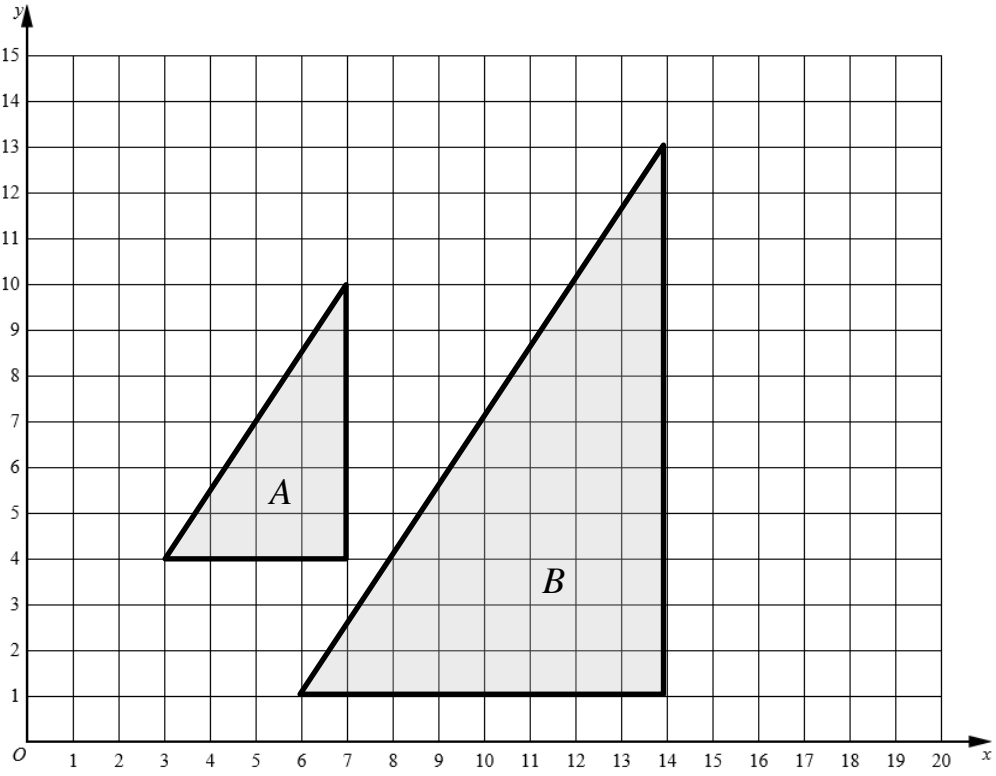
Area ……..cm^2

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27. Anne, Bilal and Colin share £3800 in the ratio 8 : 5 : 7. Work out how much each one receives.

Anne £……. Bilal £……. Colin £…….

28.



(a) Describe fully the transformation of triangle *A* onto triangle *B*.

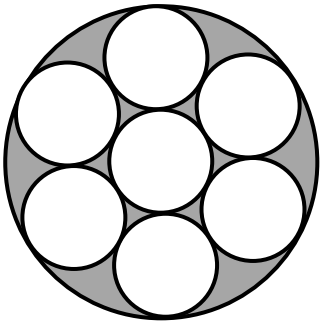
……

(b) Rotate triangle *A* 90° clockwise about (7, 10) and label it *C*.

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29. Calculate the shaded area for the following shape. Give your answer to 1 decimal place.

The radius of the outer circle is 15cm.



……..cm^2

END OF PAPER

Now go back and check your work.