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BRAINSE AN GHAIRMOIDEACHAIS

DAY VOCATIONAL CERTIFICATE EXAMINATIONS, 1969

MATHEMATICS (NEW SYLLABUS)
PAPER II

MONDAY, 16th JUNE – 9.30 to 11.30 a.m.

Answer four questions
(All questions carry equal marks.)

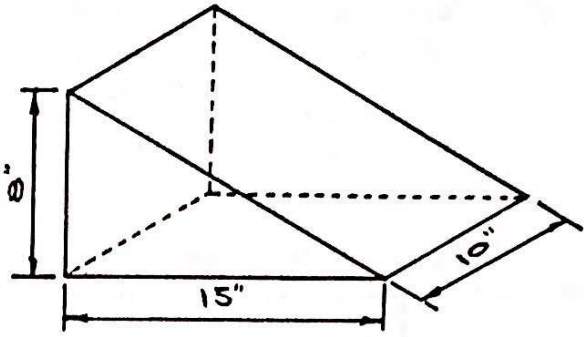
1. (a) A certain television set can be obtained on any one of the following terms:
Method A – Payment of £63 cash.
Method B – Deposit of £20 and 10/– per week for 2 years.
Method C – Rental charges of 9/– per week.
(i) How much more is spent in purchasing the set through method B than would be spent on paying outright as in method A ?
(ii) After how many weeks would as much money be paid out in rental on method C as is paid altogether through method B ?

(b) A man invests £150 in a Building Society which offers $4\frac{1}{2}\%$ interest per annum. What is the value of his investment after 1 year ?

(c) Express 0·0875 kilometres in metres.

2. (a) A rectangle 12 cm. wide has a perimeter of 84 cm. What is its length ? What is its area ?

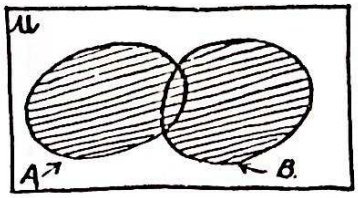
(b) The figure shows a metal wedge with a rectangular base 10 inches wide and 15 inches long. Each triangular end consists of a right-angled triangle 8 inches high. Calculate:
(i) the volume of the wedge;
(ii) its total surface area.



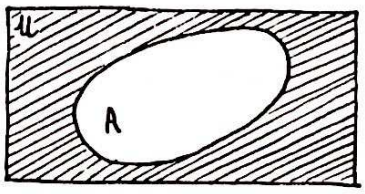
3. (a) Arrange in order using the symbol $<$
(i) $4, \frac{7}{3}, 2, \frac{5}{3}, 3$ (ii) $\frac{5}{12}, \frac{1}{3}, \frac{3}{8}, \frac{1}{2}$

(b) What set operation is indicated by the shading in each of the diagrams drawn below ?

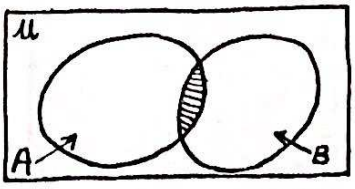
(i)



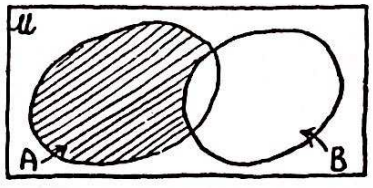
(ii)



(iii)



(iv)



(c) If $U = \{1, 2, 3, 4, 5, 6, 7, 8\}$, $A = \{1, 2, 3, 4\}$, $B = \{2, 3, 4, 6, 7\}$, list the elements of the following sets:
(i) $A \cup B$, (ii) A', (iii) B', (iv) $A' \cap B'$, (v) $(A \cup B)'$, (vi) $A \setminus B$, (vii) $B \setminus A$.
Is $A \setminus B = B \setminus A$ in this example ? Is $(A \cup B)' = A' \cap B'$?

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4. Find the solution set of each of the following:

(i) $x - 4(3x - 5) + 6(x - 2) = 5x - 12$

(ii) $x^2 + x - 42 = 0$

(iii) $\left.\begin{matrix} 2x + 3y = 23 \\ 3x + 2y = 22 \end{matrix}\right\}$

5. (a) Illustrate the following on the number line:

(i) $\{x \in \mathbb{N} \mid 3 \leqslant x < 8\}$

(ii) $\{x \in \mathbb{Z} \mid -2 \leqslant x \leqslant 3\}$

(iii) $\{x \mid x \leqslant 4\} \cap \{x \mid x \geqslant -1\}$ where $x \in \mathbb{Z}$.

(b) Plot the solution sets of each of the following on the same graph page and using the same reference axes, $x \in \mathbb{Z}$ and $0 \leqslant x \leqslant 6$ in each case:

(i) $\{(x, y) \mid y = 3x - 4\}$, (ii) $\{(x, y) \mid y = 2x - 1\}$.

From your graph write down the solution set of:

$\{(x, y) \mid y = 3x - 4\} \cap \{(x, y) \mid y = 2x - 1\}$ where $x \in \mathbb{Z}$.

6. (a) A shop window carried this notice during a sale:

"Sale: 15% reduction on all marked prices."

An article is marked £2. 10s. 0d. What would you have to pay in cash for this article during the sale ?

(b) Given that 1 metre = 39·37 inches, express the difference in inches between 110 yards and 100 metres. Which is the greater distance ?

(c) Three men A, B and C start a business by investing £2,500, £3,000 and £4,500 respectively and agree to divide any profits in proportion to their investments. In 1968 the business reaped a net profit of £600. How much of this profit should each of the investors receive ?

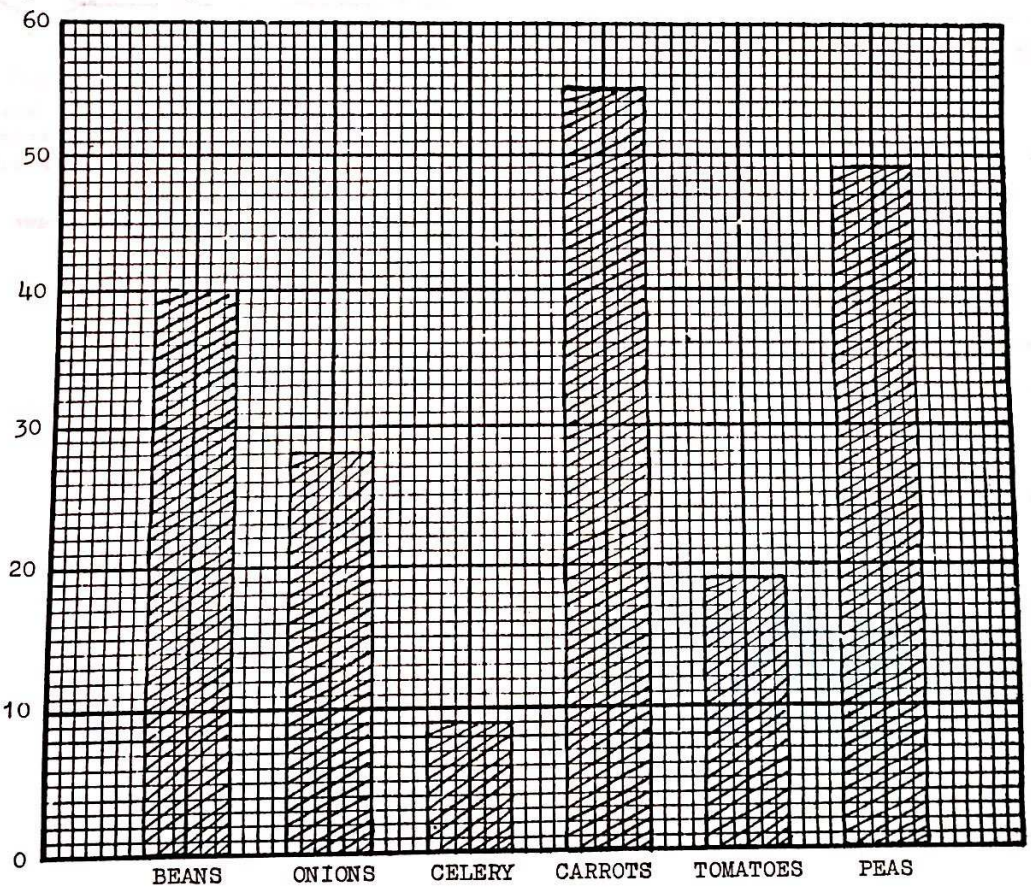
7. (a) In one day at school a class of boys spent 80 minutes at Irish, 40 minutes at Mathematics, 40 minutes at English, 80 minutes at Metalwork, 20 minutes at Civics and 20 minutes at Religious Instruction. The boys also had 60 minutes for lunch and a total of 20 minutes for breaks.

(i) What was the total number of minutes spent at school by any boy who stays on to lunch ?

(ii) What percentage of the total time was spent at lunch ?

(iii) Draw a pie-chart (sectogram) to represent this information marking clearly the size of the angle (in degrees) at the centre of each sector.

(b) Below is a bar graph of the number of tins of different vegetables sold by a certain grocer during a week.



(i) If the shopkeeper had 60 tins of each vegetable at the beginning of the week, write down the names of three vegetables he should re-order for the following week.

(ii) How many tins of vegetables altogether did he sell in the week ?

(iii) What percentage of the total original stock remains unsold at the end of the week ?