

HARRISON COLLEGE



END OF YEAR EXAMINATION

FIRST YEAR MATHEMATICS

DURATION: 1 Hour and 30 Minutes

INSTRUCTIONS TO CANDIDATES

- 1) This question paper consists of **SIX** printed pages.
- 2) This paper contains of 6 multiple choice questions and 11 essay questions.
- 3) Figures are not drawn to scale.
- 4) Calculators are **NOT allowed**.
- 5) The maximum mark for this Examination is 81.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO

Section A

ANSWER ALL QUESTIONS.

WRITE THE LETTER THAT CORRESPONDS TO THE CORRECT ANSWER.

Total 6 marks

1. $-20 + (-70) =$

- A. -90 B. -50 C. 50 D. 90 [1]

2. $78.75 \div 0.35 =$

- A. 2.25 B. 22.5 C. 225 D. 2250 [1]

3. $2\frac{1}{4} \times 3\frac{1}{2} =$

- A. $6\frac{1}{8}$ B. $6\frac{7}{8}$ C. $7\frac{1}{8}$ D. $7\frac{7}{8}$ [1]

4. If $A = \{\text{prime numbers less than } 20\}$ and $B = \{\text{multiples of } 3 \text{ less than } 20\}$ then $A \cap B =$

- A. $\{3, 9, 15\}$ B. $\{3\}$ C. $\{3, 9, 15, 21\}$ D. \emptyset [1]

5. During a sale a shop reduced the price of all of its goods by 10%. What was the sale price of an article originally priced at \$12.90.

- A. \$1.29 B. \$11.61 C. \$11.91 D. \$14.19 [1]

6. Express 0.0378 correct to 2 decimal places?

- A. 0.37 B. 0.038 C. 0.04 D. 0.037 [1]

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Section B

ANSWER ALL QUESTIONS. SHOW ALL WORKING CLEARLY.

1. a) Express $\frac{7}{8} - \frac{9}{16}$ as a single fraction. [3]
b) Calculate the answer to part a) as a percentage. [2]
c) A sum of money was shared among 3 people A, B and C in the ratio 4: 5: 6. If C receives \$120, how much money was shared among the 3 people. [3]

Total 8 marks

2. Find the value of the following

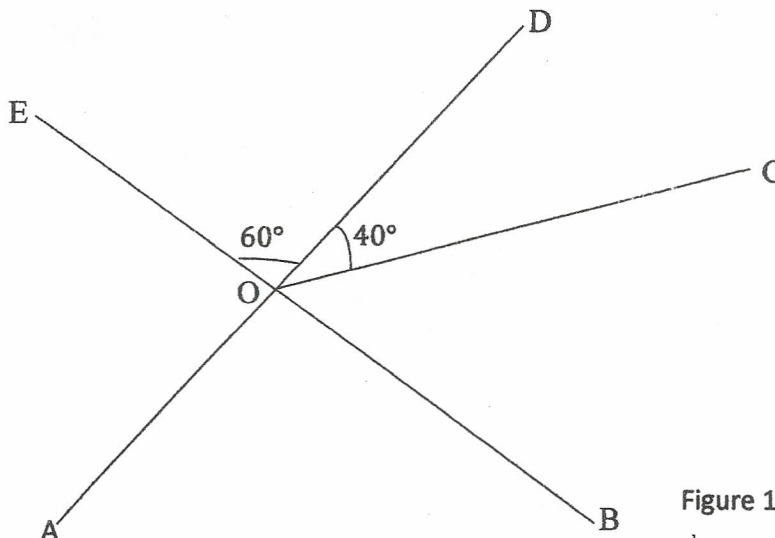
- a) 7.52×7.1 [2]
b) $\frac{4.5+8.55}{13.98-9.63}$ [3]
c) $\frac{9^3}{5^{\frac{1}{7}}} \times 1^{\frac{1}{4}}$ [3]

d) Write your answer to part (a) to 2 significant figures.

Total 8 marks

3. Find the size of the following angles

- a) In figure 1, AOD and EOB are two straight lines



- i. Angle AOB [1]

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ii. Angle AOE [2]

iii. Angle BOC [2]

b) In figure 2 below, $DA = DE$ and DE is parallel to BC . Find x . [3]

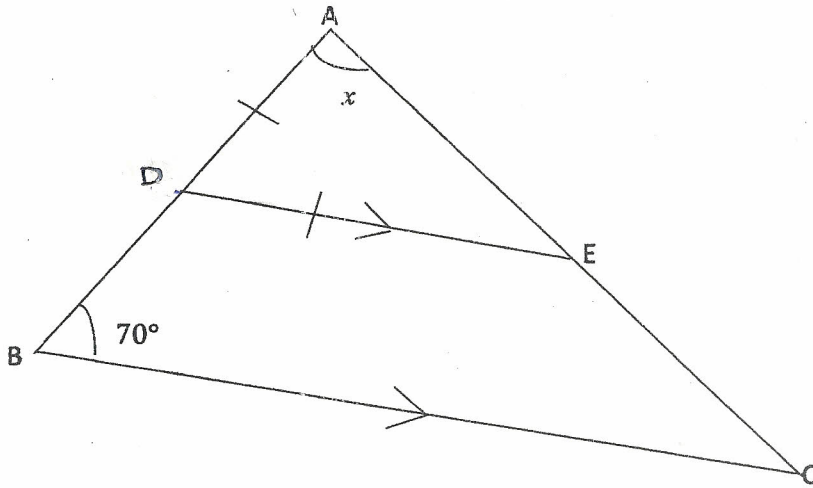


Figure 2

Total 8 marks

4. Simplify the following

a) $-7x \times 2x$ [2]

b) $-3 \times 7 + 10 - 5 \div 5$ [3]

c) $3b \times 4ab$ [2]

d) $\frac{72a^2b}{8a}$ [2]

e) $4 \times 8x + 7x \times 3$ [2]

Total 11 marks

5. Find the value of the following when $x = -6$

a) $3x + 1$ [2]

b) $11 - x$ [2]

c) $\frac{2}{3}x$ [2]

Total 6 marks

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6. A boy buys 2 packets each containing x biscuits. He eats 6 biscuits. How many biscuits does he have left. [2]

Total 2 marks

7. Solve the following equations

a) $12x + 8 = 20$ [3]

b) $50 = 7d + 1$ [3]

c) $13 - x = 10$ [2]

d) $7 + 8x = 2x + 9$ [3]

Total 11 marks

8. a) Express 60 as a product of its prime factors. [1]

- b) Find i) the HCF

ii) the LCM of

a) 60 and 90 [2]

b) 12 and 15 [2]

Total 5 marks

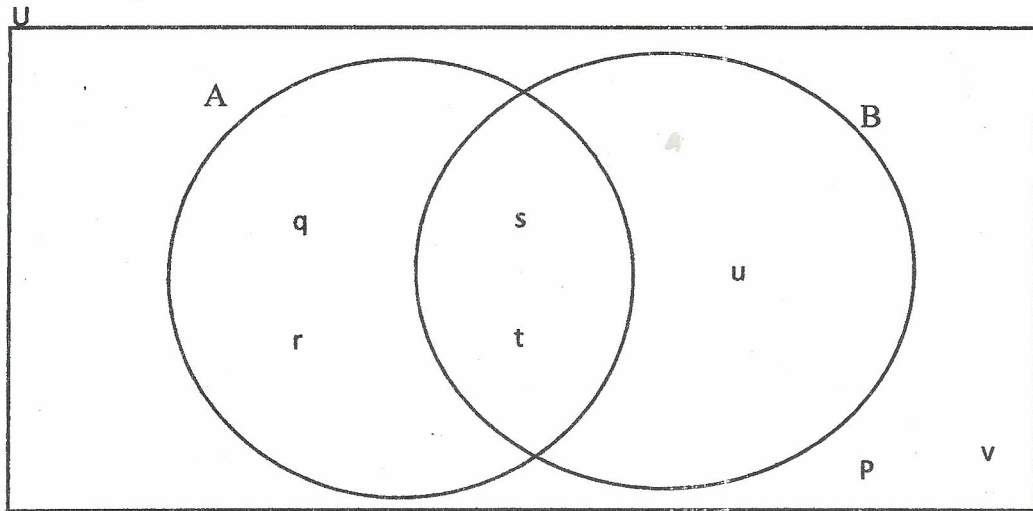
9. a) Convert 113_{10} to i) base 2 ii) base 8 [4]

- b) Convert 23_4 to base 10 [3]

Total 7 marks

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10. The Venn diagram below shows the elements of sets U, A and B.



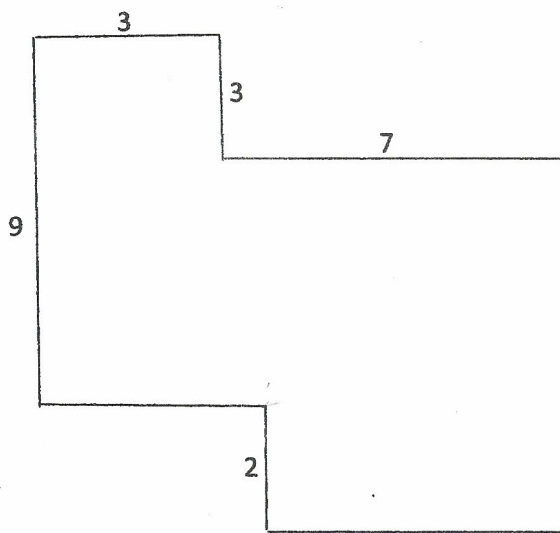
Answer the following questions.

- a) Find $n(U)$ [1]
- b) Find $n(A)$ [1]
- c) List the elements of A [1]
- d) List the elements A' [1]
- e) List the elements of $(A \cup B)'$ [1]

f) list the elements of $A \cap B$

Total 5 marks

11. Find the area of the shape below. All measurements are in metres and all angles are right angles. [4]



Total 4 marks

4
END OF EXAMINATION