170 copies V. Grimes

HARRISON COLLEGE

FIRST FORM MATHEMATICS

INTERNAL PROMOTION EXAMINATION 2015 - 2016

DURATION: 1 hour and 30 minutes

GENERAL INSTRUCTIONS TO CANDIDATES

1. This question paper consists of FOUR printed pages, including the cover page.
2. Write your name clearly on EACH sheet of paper used.
3. All 10 questions in SECTION A and all 6 questions in SECTION B are to be attempted.
4. ALL working for SECTION B should be clearly shown.
5. Number your responses carefully and identically (including any associated parts) as they appear on the question paper.
6. Calculators are **NOT** allowed.
7. The maximum mark for this examination is 85.

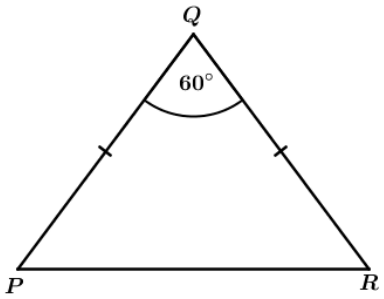
DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

SECTION A

WRITE THE LETTER THAT CORRESPONDS TO YOUR ANSWER.

1. Which of the following is a subset of the set $A = \{a, b, c, d\}$?

   (A) $\{b, c\}$ (B) $\{a, b, m\}$ (C) $\{e, f, g, h\}$ (D) $\{a, b, c, d, e\}$

2. 

   Based on the diagram above, Susie makes the following two statements.

   I: The triangle is equilateral

   II: Angle $R = 60°$

   Which of the following is/are true?

   (A) I and II (B) I only (C) II only (D) Neither

3. 20% of 20 exceeds 10% of 10 by

   (A) $\frac{1}{2}$ (B) 1 (C) 3 (D) 10

4. $(-3) + 5 + (-7) =$

   (A) -15 (B) -5 (C) 1 (D) 15

5. The prime factors of 18 are

   (A) 2, 3 (B) 2, 3, 6 (C) 2, 3, 6, 9 (D) 2, 3, 6, 9, 18

6. $89.6 \div 0.35 =$

   (A) 0.256 (B) 2.56 (C) 25.6 (D) 256

7. 0.05078 rounded correct to 3 significant figures is

   (A) 0.05 (B) 0.0507 (C) 0.0508 (D) 0.051

8. 103_8 converted to base ten is

   (A) 11 (B) 13 (C) 67 (D) 103

9. The ratio of 2 hours and 20 minutes to 5 hours and 15 minutes is

   (A) 44:103 (B) 4:9 (C) 9:4 (D) 103:44

10. A boy is x years old. His father is 4 times as old. In y years time, the father's age will be

    (A) $4(x + y)$ (B) $4x - y$ (C) $4x + y$ (D) $4(y - x)$

[10]

SECTION B

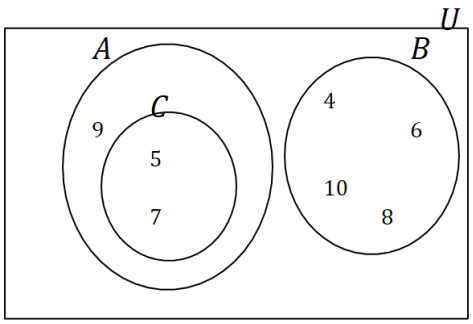
ANSWER ALL QUESTIONS IN THIS SECTION.

1. Use the prime factors method to find the
   (a) Highest Common Factor (b) Lowest Common Multiple

   of the set of numbers 10, 12 and 24. [6]

2. (a) The universal set U is defined as the set of integers between 11 and 26. A and B are the subsets of U such that
   $A = \{\text{even numbers}\}$
   $B = \{\text{multiples of 3}\}$
   (i) How many members are in the universal set, U? [1]
   (ii) List the members of the set A. [1]
   (iii) List the members of the set B. [1]
   (iv) Draw a Venn diagram to represent the information above. [4]

   (b)



   Using set notation state each of the following sets.

   (i) A [1] (iii) A' [1]
   (ii) $B \cap C$ [1] (iv) $A \cap C$ [1]

3. (a) Simplify as far as possible

$$\frac{\left(3\frac{3}{5} \times 1\frac{5}{9}\right)}{2\frac{1}{10}}$$

   [5]

   (b) A ball of string contains $13\frac{1}{2}$ metres. Lengths of 2.3 m, 1.8 m, 95 cm and 2.37 m are cut off. The remainder is divided into equal pieces each of length 32 cm. Calculate the number of equal pieces. [5]

4. (a) A man paid \$1210 for 11 goats. He sold them for a profit of 32%. What is the selling price for 1 goat? [4]

   (b) The cash price of a laptop is \$1299. It can be bought on hire purchase by making a deposit of \$350 and 10 monthly payments of \$120 each.
   (i) What is the total hire purchase price of the laptop? [3]
   (ii) How much is saved by buying the laptop for cash? [2]

5. (a) Given that $a = 2$, $b = -1$ and $c = 3$, evaluate

(i) $a - b + c$ [3]

(ii) $\frac{ab^2}{c}$ [3]

(b) Simplify as far as possible

(i) $9 \times 2 - 12 \div 2 + 2$ [3]

(ii) $12x^2y \div 3x$ [2]

(iii) $3xy \times 9$ [1]

(iv) $2n \times 5an^2$ [3]

(v) $-x - 5x$ [1]

(c) Solve the following equations

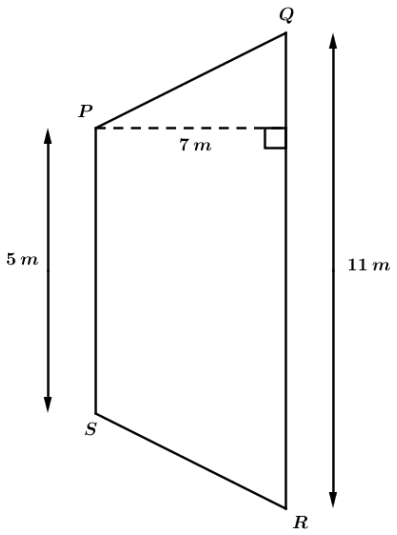
(i) $8 = 2x$ [2]

(ii) $13 - x = 10$ [2]

(iii) $6x + 7 = 55$ [3]

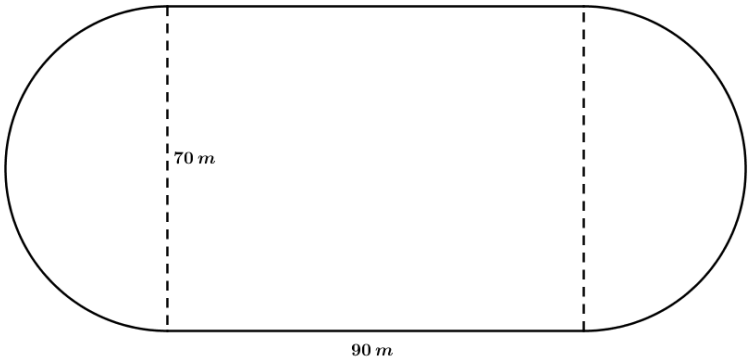
(iv) $2 = 3x - 2$ [3]

6. (a) Find the area of the trapezium below.



[3]

(b)



The Sports field shown has a 90 m by 70 m rectangular football field with semi - circular arcs at each end. A track runs around the perimeter of the sports field. Using $\pi = \frac{22}{7}$, calculate

(i) the area of the sports field, [5]

(ii) the length of one lap of the track. [5]

END OF EXAMINATION