

HARRISON COLLEGE

End of the Year Examination 2015

Second Year Mathematics



Time: 1 hour 35 minutes

Instructions to Students

1. This Examination Paper consists of **FOUR** printed pages.
2. Write your name clearly on **EACH** sheet of foolscap used.
3. All **EIGHTEEN** questions are to be attempted.
4. Number your responses carefully and identically (including any associated parts) as they appear on the question paper.
5. Do **NOT** write **ANY** of your responses beside each other.
6. Calculators are not allowed.
7. If a numerical answer cannot be given exactly, and the accuracy required is not specified in the question, then it **MUST** be given correct to **one (1)** decimal place.
8. The maximum mark for this Examination is 80.

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

Section A**Multiple Choice**

[Total: 5marks]

1. The simple interest on \$400 invested for 5 years at 7 per cent per annum is
- A. $\frac{400 \times 5}{7}$ B. $\frac{400 \times 7 \times 5}{100}$ C. $\frac{100 \times 5}{400 \times 7}$ D. $\frac{100 \times 7 \times 5}{400}$
2. $\frac{2}{3x} + \frac{7}{3x} =$
- A. $\frac{14}{9x}$ B. $\frac{9}{6x}$ C. $\frac{9}{9x}$ D. $\frac{3}{x}$
3. The missing term in the series $12, 10\frac{1}{3}, \underline{\quad}, 7, 5\frac{1}{3}$ is
- A. $8\frac{2}{3}$ B. $7\frac{1}{3}$ C. $9\frac{1}{3}$ D. $5\frac{1}{3}$
4. If $\frac{a}{b} = \frac{c}{d}$ which one of the following must be true.
- A. $a + b = c + d$ B. $a - b = c - d$ C. $ba = ac$ D. $bc = ad$
5. $\frac{3}{4} + \left(\frac{1}{2} + \frac{6}{11}\right) = \left(\frac{3}{4} + \frac{1}{2}\right) + \frac{6}{11}$ illustrates the
- A. *commutative property* B. *identity property*
C. *distributive property* D. *associative property*

Section B

[Total: 75 marks]

6. The marked price of a Television was \$2800. A housewife bought the Television on hire purchase by making a deposit of \$1120 and paying \$168 monthly for one year. How much would the housewife had saved if she had bought the Television cash. [5]

7.

Basic week	Basic Rate	Overtime Time
40 hours	\$5.00	Double

- a) How much will Ashley receive for overtime wage if he worked 8 hours overtime? [3]
b) Robin was paid \$320 for a week. How many hours did she work overtime? [3]

8. Write in standard form

- a) 0.005369 [2]
b) 565.07 [2]
c) 0.04×3.5 [3]

9. Simplify the following as far as possible

- a) $\frac{p^3q}{p^2}$ [2]

PLEASE TURN OVER

b) $\frac{7m}{5n} + \frac{5t}{3x}$ [3]

c) $5x - 3(x - 2)$ [3]

10. Solve the following equations

a) $4(y - 3) + 2(y + 1) = 0$ [4]

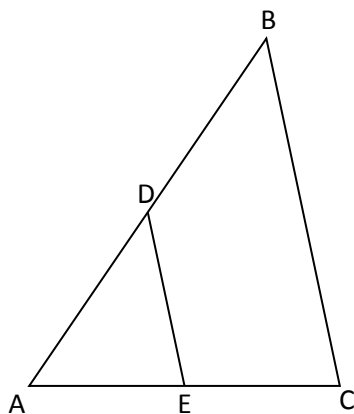
b) $\frac{5x+2}{5} - \frac{5-2x}{3} = 0$ [5]

11. Make x the subject of the following

a) $k = \frac{1}{2}mx$ [2]

b) $\frac{3}{x} + 5 = 17$ [3]

12. In the diagram ΔABC is an enlargement of ΔADE such that $\frac{AD}{AB} = \frac{AE}{AC} = \frac{1}{3}$.



If the area of $\Delta ABC = 54 \text{ cm}^2$. Find the area of BCED in cm^2 . [4]

13. Factorise the following completely.

a) $10h^2 - 5h$ [2]

b) $25x^2 - 5x$ [2]

c) $18xy^2 - 21x^2y$ [2]

14. Each interior angle of a regular polygon is 120° . How many sides does the polygon have? [3]

15. $U = \{\text{letters in the word } \mathbf{athletics}\}$

$A = \{\text{letters in the word } \mathbf{latest}\}$

$B = \{\text{letters in the word } \mathbf{health}\}$

a) List (i) $A' \cap B$ [3] (ii) $A \cup B'$ [3]

b) Draw a Venn diagram for the above information. [4]

16. a) Construct triangle KLM with ruler and compasses only. $LM = 10 \text{ cm}$, $LK = 7.5 \text{ cm}$ and angle $KLM = 60^\circ$. [4]

b) Measure and state the length of KM. [1]

c) Measure and state the size of angle KML. [1]

17. (i) Solve the following inequality $3x + (x + 1) \geq 7$, $x \in Z$. [3]

(ii) Show the solution for part (i) on a number line. [1]

18. Calculate the volume of a cylinder which is 6 cm high and has a radius of 14 cm. Use

$$\pi = \frac{22}{7}. \quad V = \pi r^2 h \quad [2]$$