

# HARRISON COLLEGE

## SECOND FORM MATHEMATICS

### INTERNAL PROMOTION EXAMINATION 2015- 2016



**DURATION: 1 hour 35 minutes**

#### **GENERAL INSTRUCTIONS TO CANDIDATES**

1. This examination paper consists of **3** printed pages including the cover page.
2. Write your name clearly on **EACH** sheet of paper used.
3. **ALL** 16 questions are to be attempted.
4. Number your questions identically as they appear on the question paper and do **NOT write your solutions to different questions beside each other.**
5. **ALL** necessary working **MUST** be shown.
6. The maximum mark for this examination is 60.
7. Calculators are **NOT** allowed.

#### **EXAMINATION MATERIALS ALLOWED**

1. Geometry set
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**DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO**

For questions 1 to 5 write the letter which corresponds your answer.

1. The distance of the earth from the sun is approximately 1 50 000 000 km. What is this distance in standard form?

- A  $1.5 \times 10^5$ km                                  B  $1.5 \times 10^6$ km  
C  $1.5 \times 10^7$ km                                  D  $1.5 \times 10^8$ km

2. A woman's basic rate of pay is \$12 per hour for a 40 hour week. Overtime is paid at the rate of time-and-a-half. What is the woman's weekly wage if she worked 46 hours in that particular week?

- A \$552    B \$480  
C \$660    D \$588

3. If  $2(3 - y) \leq 4y - 12$ , then

- A  $y \geq 3$     B  $y \geq 1$   
C  $y \leq -3$     D  $y \geq -1$

4. Given that  $U = \{a, b, c, d, e, f\}$ ,  $A = \{a, b, c\}$ ,  $B = \{b, c, d, e\}$ , what is  $A' \cap B$ ?

- A  $\{f\}$     B  $\{d, e, f\}$   
C  $\{d, e\}$     D  $\{d\}$

5. If  $\frac{x-1}{3} + 2 = \frac{x+5}{4}$ , then the value of  $x$  is

- A 8    B 3  
C -5    D -30

[5]

6. Find the value of the following, giving your answers in standard form:

- a)  $6.12 \times 10^3 + 3.995 \times 10^2$     [4]  
b)  $(3.5 \times 10^{-3}) \div (7 \times 10^{-5})$     [3]

7. A large map of a certain country hangs on the wall of a room. The scale on the map is 1:10 000.

- a) What is the actual distance, in metres, between two villages that are 2 cm apart?    [2]  
b) The actual distance between two towns is 14 km. What is the distance on the map that represents this?    [2]

8. Mr. Ward earned \$300 in simple interest when he invested \$4 000 for 3 years in a savings account with The National Bank of Bim. What is the bank's annual rate of interest?    [2]

9. Remove the brackets and simplify:

- a)  $3(x + y) + 2(x - y)$     [3]  
b)  $x(2y - 3z) - y(4x - 5z)$     [4]

10. Solve the following equations:

- a)  $3(x - 3) + 5 = 8 - x$     [2]  
b)  $\frac{x}{3} + \frac{x}{5} = 2$     [3]

11. Make  $x$  the subject of the following equations:

a)  $4y = 27 + 3x$  [2]

b)  $12a + 3xb = 14q$  [2]

c)  $Z = A(3x + 2y)$  [3]

12. Write down the 7<sup>th</sup> and 8<sup>th</sup> terms in the following sequences.

a) 1, 4, 9, 16, ... [2]

b)  $\frac{1}{8}, \frac{1}{4}, \frac{1}{2}, 1, \dots$  [2]

13. In a check of 100 vehicles, the police found that 30 vehicles had defective lights, 17 had defective brakes and 63 had no defect at all.

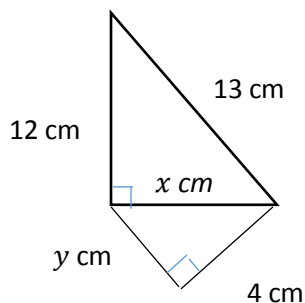
Letting  $x$  represent the number of vehicles with both defective lights and defective brakes,

a) Draw a Venn diagram to represent this information. [5]

b) Calculate the value of  $x$ . [2]

c) Determine the number of vehicles with only faulty lights. [1]

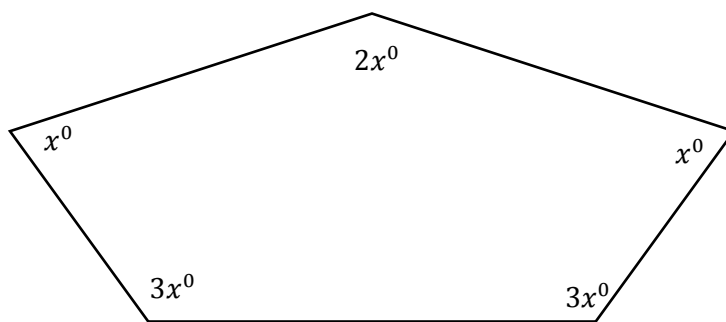
14. Find the values of  $x$  and  $y$  in the diagram below.



[3]

15. The interior angles of a pentagon are  $x^0$ ,  $x^0$ ,  $2x^0$ ,  $3x^0$  and  $3x^0$ . Calculate the value of  $x$ .

[3]



16. Using a ruler, a pencil and a pair of compasses, construct a triangle  $PQR$  in which  $PQ = 8\text{cm}$ ,  $PR = 6\text{cm}$  and angle  $P = 60^0$ .

[3]

Measure and state i) the length of  $RQ$  [1]

ii) the size of the angle at  $Q$ . [1]