

Year 9 MATHEMATICS EXAMINATION

SEMESTER 1 2017

QUESTION AND ANSWER BOOKLET



**KINROSS
COLLEGE**

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STUDENT NAME:

TEACHER:

DATE:

TIME ALLOWED FOR THIS PAPER

Reading time before commencing work: 10 minutes

Working time for this paper: 100 minutes

MATERIAL TO BE PROVIDED BY THE SUPERVISOR

- This Question/Answer Booklet

MATERIAL TO BE PROVIDED BY THE CANDIDATE

- Pen/pencil for answering questions
- Erasing stationery
- Up to two scientific calculators
- Written notes on **one** unfolded A4 sized paper; can be double-sided

TOTAL QUESTIONS: 26

TOTAL MARKS: 105

Section 1: Non - Calculator - assumed 55 minutes (47 marks)

Section 2: Calculator 45 minutes (58 marks)

Attempt questions

AT THE END OF THE EXAMINATION

Attach any extra sheets used to this Question/Answer booklet.

IMPORTANT NOTE TO CANDIDATES

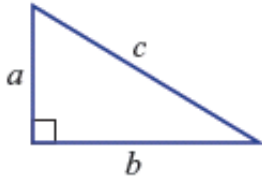
No other items may be taken into the examination room.

It is your responsibility to ensure that you do not have any unauthorised notes or other items of a non-personal nature in the examination room. If you have any unauthorised material with you, hand it to the supervisor BEFORE reading any further.

Section 1: Multiple choice NON - CALCULATOR (Total 10 marks, one mark per question)

1.

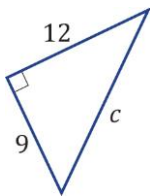
Which of the following mathematical statements is *true*?



- (a) $c^2 = a^2 + b^2$
- (b) $b^2 = c + a^2$
- (c) $c^2 = a + b$
- (d) $a^2 = b - c^2$
- (e) $c^2 = b^2 + b^2$

2.

Find the length of the hypotenuse in the following right-angled triangle:



- (a) 11
- (b) 13
- (c) 15
- (d) 7
- (e) 21

3.

Helen invests \$10 000 in a simple interest bank account that pays 5% annually. How much will be in her bank account after 3 years?

- (a) \$10 150
- (b) \$11 500
- (c) \$12 000
- (d) \$12 500
- (e) \$13 000

4.

How long does Kim need to invest \$5000 at 4% p.a. simple interest in order to produce \$100 interest?

- (a) 2 months
- (b) 1 year
- (c) 3 months
- (d) 2 years
- (e) 6 months

5.

$2x^7 \times 7x^3$ is equivalent to:

- (a) $14x^{21}$
- (b) $14x^{10}$
- (c) $14x^4$
- (d) $9x^{10}$
- (e) $9x^{21}$

6.

$(x)^3$ in expanded form is:

- (a) $x \times x \times x$
- (b) $3 \times x \times x \times x$
- (c) $3 \times 3 \times 3 \times x \times x \times x$
- (d) $3x^3 \times 3x^3 \times 3x^3$
- (e) $(3x)^3 \times (3x)^3 \times (3x)^3$

7.

A letter is selected at random from the word STATISTICS. The probability of selecting a vowel is:

- (a) $\frac{1}{5}$
- (b) $\frac{1}{4}$
- (c) $\frac{3}{10}$
- (d) $\frac{1}{3}$
- (e) $\frac{2}{5}$

8.

$\frac{6a^7b^5}{3a^2b^8}$ simplifies to:

(a) $\frac{2a^5}{b^3}$

(b) $\frac{b^5}{2a^3}$

(c) $\frac{2a^3}{b^5}$

(d) $\frac{2b^3}{a^5}$

(e) $\frac{a^5}{2b^3}$

9.

An algebraic expression that represents 5 less than double x is:

(a) $2(x - 5)$

(b) $5 - 2x$

(c) $2(5 - x)$

(d) $2x - 5$

(e) $x - 2 \cdot 5$

10.

Nine less than a certain number is 3 more than twice the same number. The number is:

(a) -2

(b) 12

(c) 2

(d) -12

(e) 6

Short Answer Non - Calculator (Total 37 marks)**11.****(1, 1, 1, 2)****Simplify the following.**

a) $3^{-2}a$

b) $\frac{2b^2}{8b}$

c) $4ab - 7a^2b + 2b - ba + 2a^2b$

d) $9a + 15ab \div 3a - 6b$

12.**(1, 2, 2, 3)****Solve each of the following equations.**

a) $2x = 10$

b) $\frac{x}{3} = 3$

c) $\frac{5-6x}{4} = 2$

d) $8x - 3 = 5x + 9$

13.**1,2,3**

Write linear equations for each of the following statements, using “x” to represent the unknown. (Do not solve the equations.)

a) Seven times a certain number is 24.

b) Three subtracted from five times a certain number gives a result of -7.

c) The sum of 3 times a certain number and 4 is divided by 2, which gives a result of 5.

14.**1,2,2**

Simplify the following using the index laws.

a) $a^4 \div a^2$

b) $\frac{5d^8}{15d^2}$

c) $3k^0 + 5^0$

15.

2,2,3

Simplify the following using the index laws.

a) $(a^2b^3)^5$

b) $\left(\frac{2w^4}{r^2}\right)^3$

c) $\frac{5h^7k^3 \times 4h^2k}{8h^3k^5}$

16.

2,2,2

Two people are selected *without replacement* from a group of four: Adam (A), Brenda (B), Caroline (C) and Darren (D).

a) List all the possible combinations for the selection by completing the following table.

| | | 1st | | | |
|-----|---|--------|--------|---|---|
| | | A | B | C | D |
| 2nd | A | × | (B, A) | | |
| | B | (A, B) | × | | |
| | C | | | × | |
| | D | | | | × |

b) Find the probability that the selection will contain Brenda and Darren.

c) Find the probability that the selection will contain Caroline.

END OF NON CALCULATOR SECTION

COMMENCE CALCULATOR ASSUMED SECTION

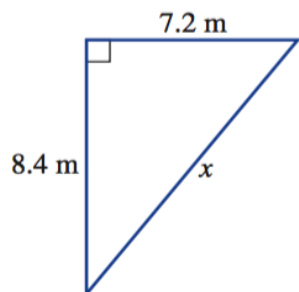
Section 1: CALCULATOR – ASSUMED (TOTAL 58 marks)

1.

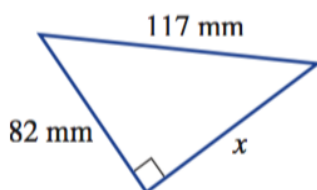
2, 2

Calculate x , correct to 2 decimal places.

a)



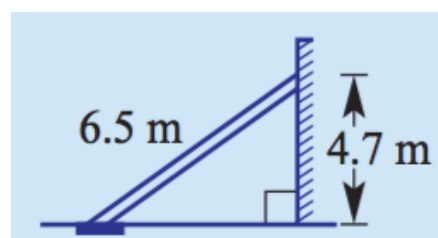
b)



2.

4

A steel support beam of length 6.5 m is connected to a wall at a height of 4.7 m from the ground. Find the distance (to the nearest cm) between the base of the building and the point where the beam is joined to the ground.



Using the simple interest formula calculate the interest, and then the amount of the following investments.

(a) Huey invests \$800 at 4% per year for 3 years.

Interest= _____ Amount = _____

(b) Dewey invests \$1200 at 7% per year for 13 months.

Interest= _____ Amount = _____

(c) Louie invests \$1600 at 0.5% per month for 2 years.

Interest= _____ Amount = _____

5.

5

Wendy wins \$5000 during a chess tournament. She wishes to invest her winnings, and has the two choices given below. Which one gives her the greater total at the end of the time?

Choice 1: 8.5% p.a. simple interest for 4 years

Choice 2: 8% p.a. simple interest for 54 months

6.

3,3,3

Write an equation to represent each of the following and then solve it for the pronumeral.

a) A number n is doubled and increased by 3 to give 21.

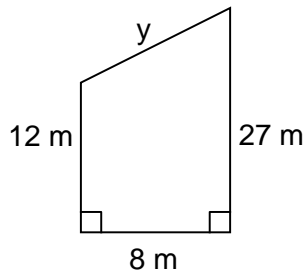
b) A number of lollies is decreased by 5 and then shared equally among three friends so that they each get 7.

c) 5 less than the result of Toni's age x divided by 4 is 0.

7.

4

A block of land has the dimensions as shown in the diagram below. Use the information to find the perimeter of the block.



8.

2,2

Simplify the following:

a)

$$\frac{(2a^4b)^2 \times 6(ab^0)^2}{a(3b^5)^0 \times (2a^2)^3}$$

b)

$$\frac{(4m^2n^3)^2}{2m^3n^4}$$

9.

2

Write the following numbers in scientific notation:

a) 350 000

b) 0.097

10.

2,1,1,1

Two ice creams are randomly selected without replacement from a box containing one vanilla (V), two strawberries (S) and one chocolate (C) flavoured ice creams.

a) Draw a tree diagram to show each of the possible outcomes.

b) What is the probability of selecting:

(i) a vanilla and a strawberry flavoured ice cream?

(ii) two strawberry flavoured ice creams?

(iii) no vanilla flavoured ice cream?

END OF EXAMINATION