

YEAR 9 MATHEMATICS EXAMINATION

SEMESTER 1 2016

QUESTION AND ANSWER BOOKLET



STUDENT NAME:
TEACHER:
DATE:

TIME ALLOWED FOR THIS PAPER

Reading time before commencing work: 10 minutes

Working time for this paper: 105 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: 47

TOTAL MARKS: 108

Section 1: Multiple choice

28 questions, 28 marks

Attempt questions 1 - 28

Section 2: Written answer

19 questions, 80 marks

Attempt questions 1 - 19

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.

Do not turn the page until you are asked to do so.

Section 1: Multiple choice (Total 28 marks, one mark per question)

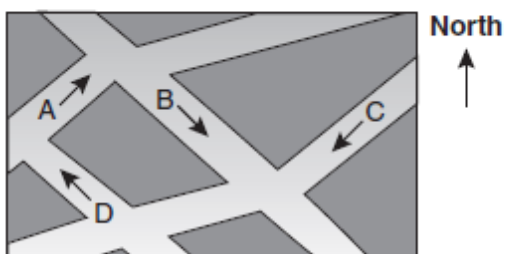
1. 50, 100, 150, 200, 250, ?

Which number comes next in this sequence?

- a) 251
 - b) 260
 - c) 300
 - d) 350
2. An airline bought 6 new planes for a total cost of \$721.5 million. Each plane cost the same amount.

How much did each plane cost?

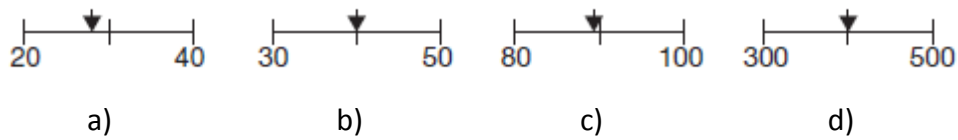
- a) \$120.25 million
 - b) \$360.75 million
 - c) \$715.5 million
 - d) \$4329 million
3. The map shows the different directions four cars are travelling.



Which car is travelling south-east?

- a) Car A
- b) Car B
- c) Car C
- d) Car D

7. Which arrow is pointing to the approximate position of $\sqrt{800}$ on a number line?



8. Sarah is painting a wall using three colours.
She paints $\frac{1}{3}$ of the wall blue, $\frac{1}{4}$ of the wall green and the rest yellow.
What fraction of the wall does she paint yellow?

- a) $\frac{10}{12}$ b) $\frac{5}{12}$ c) $\frac{5}{7}$ d) $\frac{7}{12}$

9. Mike sells cars. His weekly salary, S dollars, is calculated using this rule:

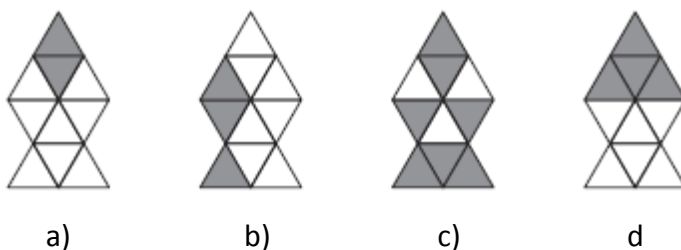
$$S = 500 + 0.02V$$

where V is the total value in dollars of the cars he sells that week.
Last week, the total value of cars Mike sold was \$120 000.

What was Mike's salary last week?

- a) \$740 b) \$1205 c) \$2900 d) \$6000 e) \$24 000

10. Which shape has $\frac{2}{5}$ shaded?



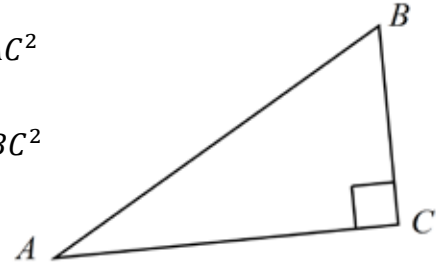
11. Which statement is not correct?

a) $AB^2 = BC^2 + AC^2$

c) $BC^2 = AB^2 - AC^2$

b) $AB^2 = BC^2 - AC^2$

d) $AC^2 = AB^2 - BC^2$



12. What is the simple interest earned after six years when \$450 is invested into an account that pays 3% per annum?

a) \$81.00

c) \$87.32

b) \$531.00

d) \$537.32

13. Which expression does not equal $3x$?

a) $x \times x \times x$

b) $3 \times x$

c) $4x - x$

d) $x + x + x$

14. The expression $\frac{h^8 \times h}{h^2}$ simplifies to:

a) h^7

b) $\frac{1}{h^7}$

c) $\frac{1}{h^6}$

d) $\frac{1}{h^4}$

15. Expanded, $(y - 2)^2$ is equivalent to:

a) $y^2 - 4$

b) $y^2 - 4y + 4$

c) $4 - y^2$

d) $y^2 + 4y + 4$

16. $(x - 4)(x + 5)$ expands to:

- a) $x^2 + x - 20$
- b) $x^2 + x - 9$
- c) $x^2 - 9x - 20$
- d) $x^2 + 9x + 20$

17. Expanded, $-3(2x - 1)$ is equal to:

- a) $6x + 3$
- b) $-6x + 3$
- c) $2x + 3$
- d) $6x - 1$

18. Use your calculator to evaluate $\frac{\sqrt{11}-1}{\sqrt{3}}$ correct to 2 decimal places.

- a) 1.33
- b) 2.73
- c) 1.34
- d) 2.74

19. A bag is marked at \$120. A retailer offers a 15% discount.
What is the discounted price?

- a) \$18
- b) \$105
- c) \$102
- d) \$112

20. Fully factorising $5g^5t^7 - 10g^5t$ gives:

- a) $5g^5t(t^6 - 2)$
- b) $5gt(gt^{12} - 2)$
- c) $5g^5(t^7 - 2t)$
- d) $g^5t(5t^6 - 10)$

21. Evaluated, $(2)^5 \times (m^2)^3 \times (m^6)^2$ equals:

a) $10m^{17}$

c) $32m^{17}$

b) $25m^6$

d) $32m^{18}$

22. The number 15^{-2} is equivalent to:

a) 30^{-1}

c) -15^2

b) $\frac{1}{30}$

d) $\frac{1}{225}$

23. What is the solution to the equation $3m + 1 = 4 - m$?

a) $m = \frac{3}{4}$

c) $m = \frac{5}{4}$

b) $m = \frac{3}{2}$

d) $m = \frac{5}{2}$

24. If $4x = 48$ what is the value of $\frac{x}{3}$?

a) 4

c) 9

b) 11

d) 12

25. The expression $\frac{5^{-2}}{4^{-2}}$ evaluates to:

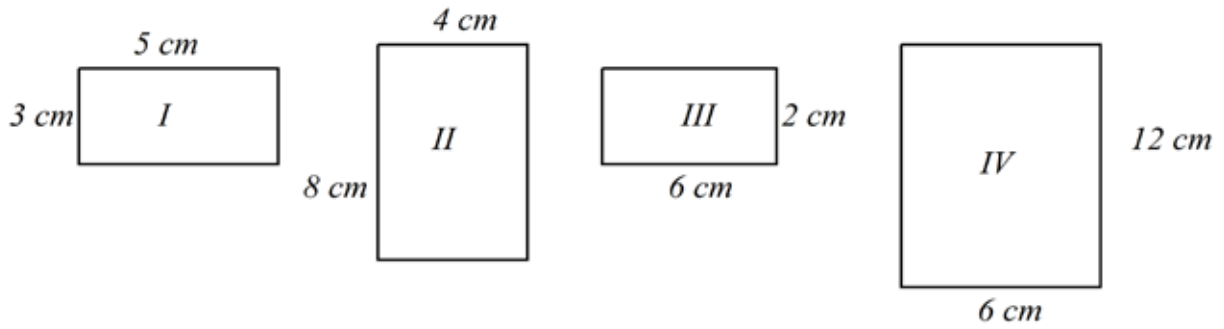
a) $\frac{5}{2}$

b) $\frac{16}{25}$

c) $\frac{8}{5}$

d) $\frac{64}{25}$

26. Four rectangles are shown below.



Which two are similar?

- a) I and II b) II and III c) I and IV d) II and IV

27. This sign shows times that a car can be parked for up to 1 hour.

At which of these times is it permitted to park for two hours?

- a) 11:00 am Thursday
b) 4:00 pm Thursday
c) 11:00 am Saturday
d) 4:00 pm Saturday



28. Which of the following is the larger number?

a) $1\frac{1}{4}$

b) $\frac{7}{5}$

c) 1.3

d) $\frac{10}{7}$

a)

b)

c)

d)

Section 2: Written answer (Total 80 marks)*Mark/s*1. Factorise $88 - 16x$.*1 Mark*

2. Fill in the blanks for the following table:

4 Marks

Index form	Expanded form
13^5	
	$2.7 \times 2.7 \times 2.7 \times 2.7$
s^3t^4	
	$9 \times l \times l \times m \times m \times m \times m \times n$

3. Simplify the following, writing your answers in index form:

a) $35p^8 \div 5p^4$

2 Marks

b) $(a^4)^3$

2 Marks

c) $6a^4b^7 \times 8a^6b$

3 Marks

d) $(2a^4c)^5$

3 Marks

e) $5t^0$

2 Marks

f) $\frac{4^{-2}}{4^3}$

3 Marks

4. Jordan and Poppy invest \$24000 in the ratio of 7:9.
How much does each person receive?

3 Marks

5. Solve these equations.

a) $11 = x - 4$

2 Marks

b) $\frac{8x-2}{3} = 4x$

3 Marks

6. Simplify the following:

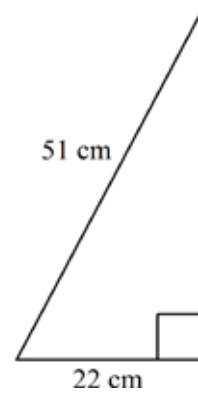
a) $\frac{28x^7y^5}{2x^6y}$

2 Marks

b) $2m^2n \times 8mn^4 \div (2mn)^3$

3 Marks

7. What is the perpendicular height of the triangle, correct to the nearest centimetre? 4 Marks



8. What is the price paid for a Samsung Galaxy S3 if the selling price is \$225 plus 10% GST? 2 Marks

9. Simplify.

a) $-4x \times 5y$

1 Mark

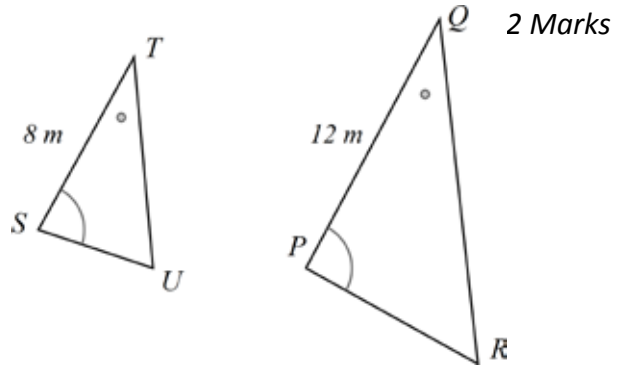
b) $\frac{7ab}{21a}$

2 Marks

10. Morgan borrows \$8 500 from his parents for his first car. He will be charged 2% simple interest over 2 years. How much money will Morgan owe in total? 2 Marks

11. Bree borrows \$15 000 at 6% simple interest and is charged \$4 500 interest in total for her loan. How many years was the loan taken over? 3 Marks

12. $\triangle STU$ has been enlarged to produce $\triangle PQR$.
What is the scale factor?



13. Write an expression for each of the following:

a) Five times the sum of A and B

1 Mark

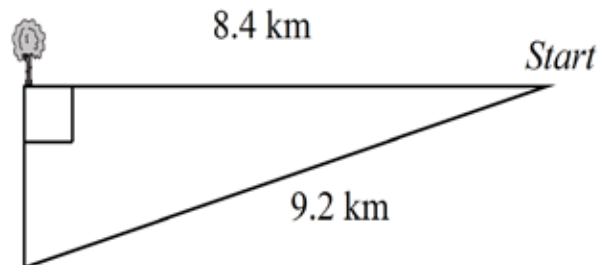
b) Its Fair day! You pay for four rides on the supernova at $\$S$ each and three rides on a rollercoaster at $\$R$ each.

1 Mark

14. Oscar is on a hike. From his starting point he intends to walk 8.4 km west to a large tree. 6 Marks

He discovers, after walking 9.2 km, that he is off course and is now due south of the tree, so he then walks due north to his destination.

How much further did he walk than he originally intended? Round all answers to 1 decimal place.



15. Simplify each of the following:

a) $2s + 4t + 5s + 9t$

1 Mark

b) $81f + 12d - 9f + 62d$

1 Mark

c) $12x^2y - 3ab - 12xy^2 + 14ab$

2 Marks

16. Fill in the blanks for the following expressions:

a) $2(x + 4) = 2x + \underline{\hspace{2cm}}$

1 Mark

b) $5(x - \underline{\hspace{2cm}}) = 5x - 15$

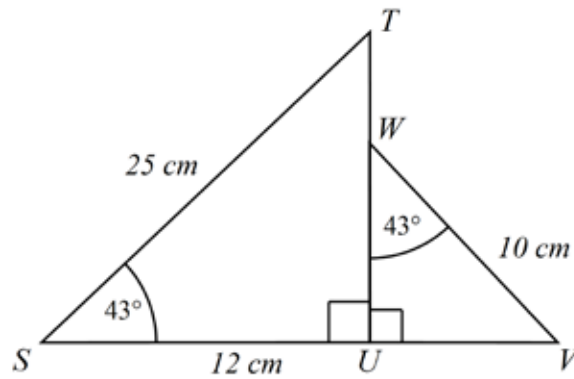
1 Mark

17. Jamie made a cake for the family to share. As soon as it was iced, Krystal and Jamie each ate $\frac{1}{6}$ of it, Michael ate $\frac{1}{4}$, and Eva and Michelle ate $\frac{1}{12}$ each. What fraction of the cake was left for the next day?

2 Marks

18. Prove that $\Delta STU \sim \Delta WVU$.

6 Marks



19. A fashion designer's customised rectangular piece of fabric has a perimeter of 140 cm. It has a length of x cm and a width of y cm.

a) Write an equation for the perimeter of this piece of fabric.

1 Mark

b) Rearrange this equation to make y the subject.

2 Marks

c) Use your answer to (b) to write an equation for the area of the fabric in terms of x .

1 Mark

d) Expand this equation. Simplify if possible.

1 Mark

e) Given that $x = 42$ cm, find the area and width of the piece of paper.

4 Marks

END OF EXAMINATION