

OXFORD CAMBRIDGE AND RSA EXAMINATIONS
General Certificate of Secondary Education
MATHEMATICS SYLLABUS A

1962/3

PAPER 3 (Intermediate Tier)

Monday **5 JUNE 2006** Afternoon 2 hours

Candidates answer on the question paper.

Additional materials:

Geometrical instruments

Tracing paper (optional)

Candidate Name	Centre Number	Candidate Number											
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TIME 2 hours

INSTRUCTIONS TO CANDIDATES

- Write your name in the space above.
- Write your Centre number and candidate number in the boxes above.
- Answer **all** the questions.
- Write your answers, in blue or black ink, in the spaces provided on the question paper.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- Show your working. Marks may be given for working that shows that you know how to solve the problem even if you get the answer wrong.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.



WARNING

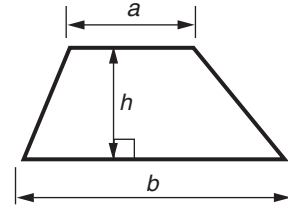
You are not allowed to use a calculator in this paper.

FOR EXAMINER'S USE

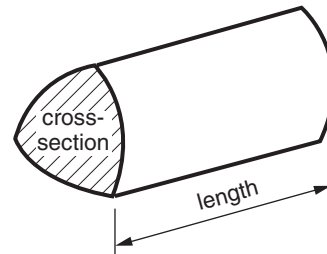
This question paper consists of 17 printed pages and 3 blank pages.

Formulae Sheet: Intermediate Tier

Area of trapezium = $\frac{1}{2}(a + b)h$



Volume of prism = (area of cross-section) \times length



1 Work out.

(a) 0.6×0.3

.....

(a) _____ [1]

(b) 2×-5

(b) _____ [1]

(c) $\frac{3}{5} \times \frac{1}{2}$

.....

(c) _____ [1]

(d) 8^2

.....

(d) _____ [1]

(e) 10^3

.....

(e) _____ [1]

2 A survey of the numbers of cars, vans and motorcycles parked in a small car park was carried out .

Some of the results are shown in the table below.

Fill in the six missing results.

	Cars	Vans	Motorcycles	TOTAL
Saturday	35	20		68
Sunday	12	0	15	
Monday	15			
TOTAL	62	25		150

[3]

3 Here is a number machine.



(a) What is the OUTPUT when the INPUT is 4?

.....

(a) _____ [1]

(b) What is the INPUT when the OUTPUT is 8?

.....

(b) _____ [1]

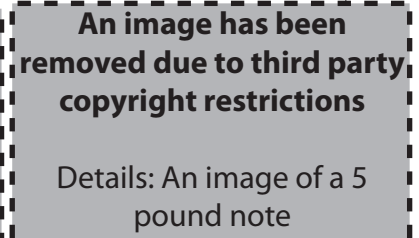
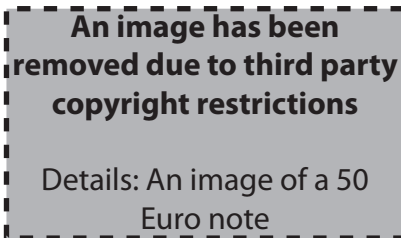
(c) What is the OUTPUT when the INPUT is n?

.....

(c) _____ [2]

4 Jack went on holiday to France.

(a) He changed £400 into euros (€).
 The exchange rate was £1 = €1.5.
 How many euros did he receive?



.....

(a) € _____ [2]

(b) When Jack returned from his holiday he had €60 left.
 He changed the €60 into pounds at a rate of £1 = €2.
 How many pounds did he receive?

.....

(b) £ _____ [2]

5 In each case, write the name of a quadrilateral with the given properties.

	Parallel sides	Equal sides	Equal angles	Name
(a)	2 pairs	2 pairs	2 pairs	
(b)	none	2 pairs	only 1 pair	

[2]

6 A tutor group raised £200 for charity.

(a) Emma raised 15% of the £200.
How much did Emma raise?

.....
.....

(a) £ _____ [2]

(b) Tariq raised £70.
What is 70 out of 200 as a percentage?

.....
.....

(b) _____ % [2]

7 Solve.

(a) $3x - 4 = 11$

.....
.....

(a) _____ [2]

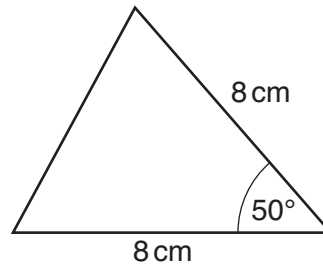
(b) $5x + 1 = 7 + 3x$

.....
.....
.....

(b) _____ [3]

6

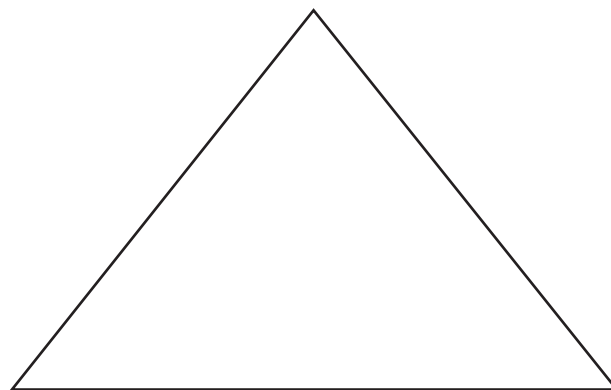
- 8 (a) Here is a sketch of a triangle.
Make an **accurate**, full-size drawing
of the triangle.



NOT TO SCALE

[3]

- (b) Here is a **different** triangle, drawn accurately.
Make some measurements, in centimetres, and use them to work out the area of the
triangle.



.....
.....
.....
.....

(b) _____ cm² [3]

- 9 Some of the probabilities of obtaining the numbers on a biased, 6-sided dice are shown in the table below.

Number	1	2	3	4	5	6
Probability	0.25	0.1	0.1		0.1	0.25

- (a) Work out the probability of obtaining a 4.

.....

(a) _____ [2]

- (b) Work out the probability of obtaining an **odd number** when this dice is thrown.

.....

(b) _____ [2]

- 10 **Estimate** the answer to this calculation.

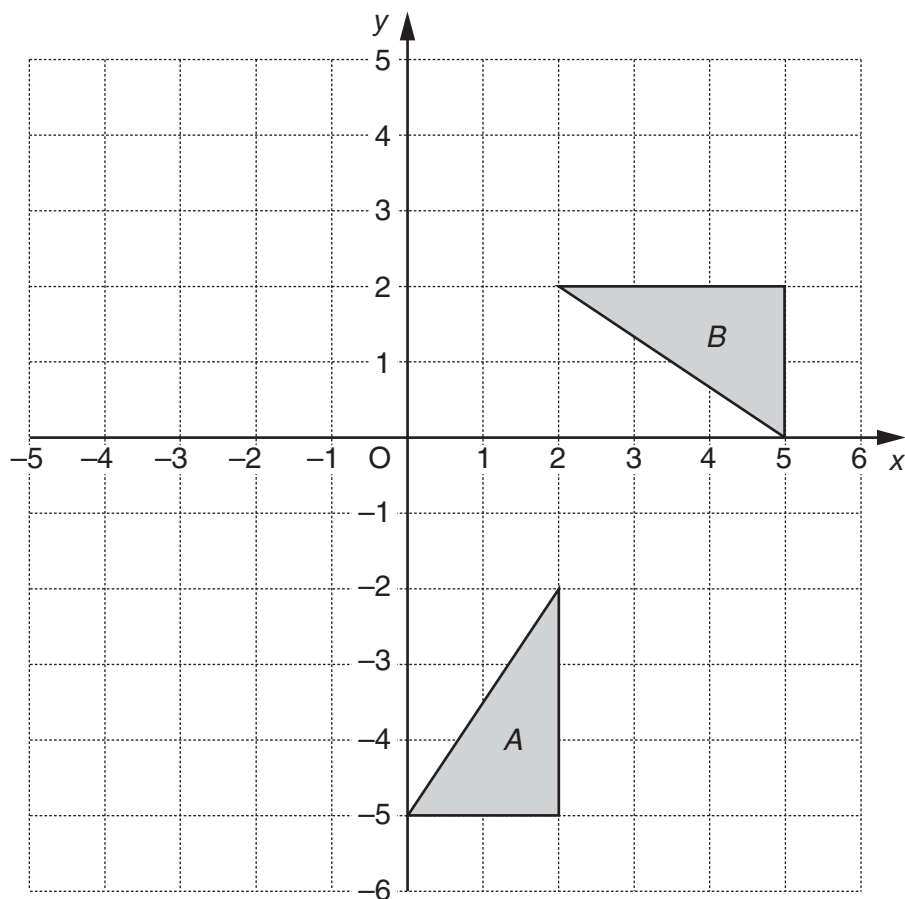
$$\frac{19.5 \times 6.1}{3.8}$$

Show clearly the values you use.

.....

_____ [2]

11



- (a) Translate **triangle A** by 4 squares to the left and 6 squares up.
Label the image P.

[1]

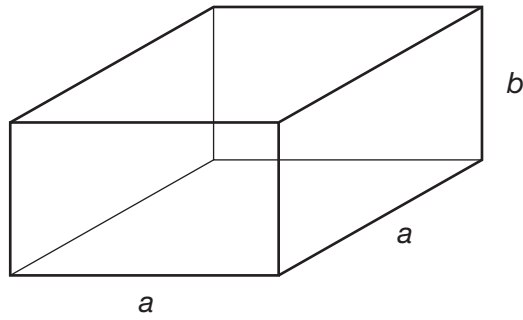
- (b) Reflect **triangle A** in the line $x = -1$.
Label the image Q.

[2]

- (c) Describe fully the **single** transformation that maps **triangle A** onto triangle B.

[3]

12 (a) This square based cuboid framework is made using rods of length a and b .



Work out the **total length** of the rods needed to make this framework.
Write your answer as simply as possible in terms of a and b .

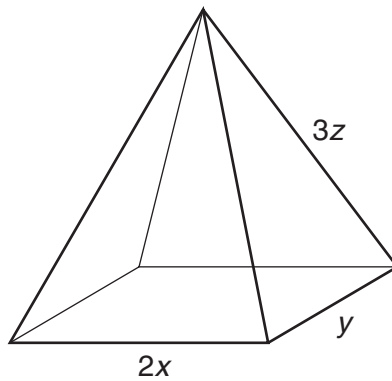
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(a) _____ [2]

(b) Here is another framework made from rods.
The rectangular base is made using rods of length $2x$ and y .
The sloping rods are each of length $3z$.



Work out the **total length** of the rods needed to make this framework.
Write your answer as simply as possible in terms of x , y and z .

.....

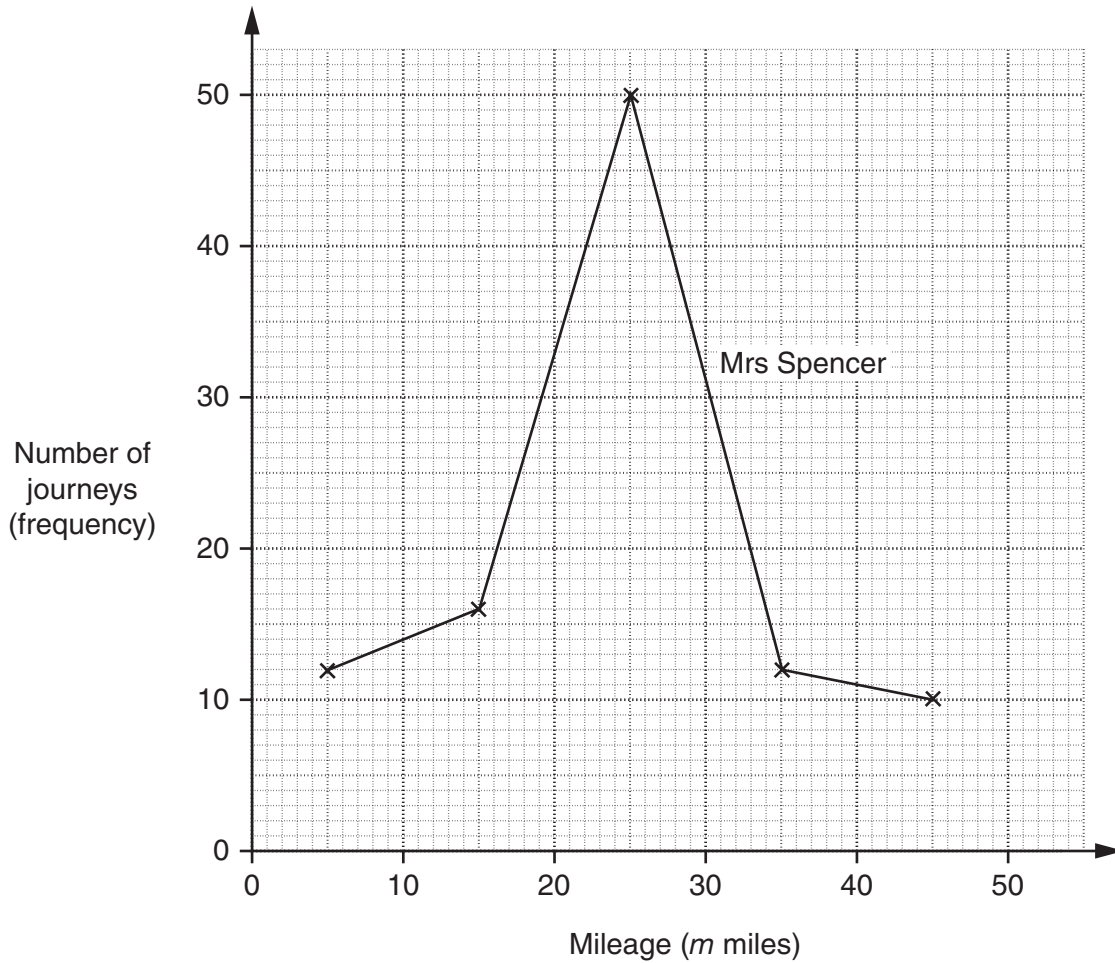
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(b) _____ [3]

- 13 Mrs Spencer and Mr Patel both work for the same company. In 2005 they each recorded the mileage of every journey they made for the company. The mileages for Mrs Spencer's journeys are summarised in the frequency polygon below.



The mileages for Mr Patel's journeys are summarised in this table.

Mileage (m miles)	$0 < m \leq 10$	$10 < m \leq 20$	$20 < m \leq 30$	$30 < m \leq 40$
Frequency	38	44	10	8

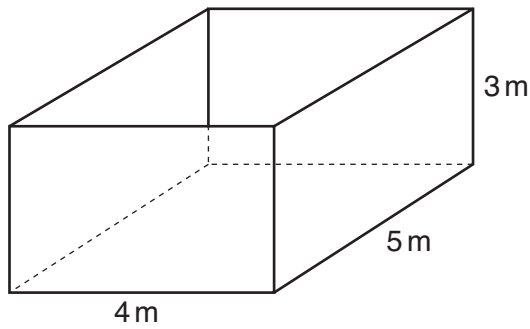
- (a) Draw, on the same grid, the frequency polygon for the mileages of Mr Patel's journeys. [2]

- (b) Make two comparisons between the mileages of Mrs Spencer's and Mr Patel's journeys.

1. _____

2. _____
 _____ [2]

14 A tank is a cuboid with an open top.



The **five** outside faces of the tank are to be painted.
A tin of paint contains enough paint to cover 20 m^2 .

How many tins of paint are needed to paint the outside of the tank?
Show your working clearly.

.....

.....

.....

.....

.....

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_____ [6]

15 Multiply out and simplify completely.

(a) $2(3x + 1) + 4(x - 2)$

.....

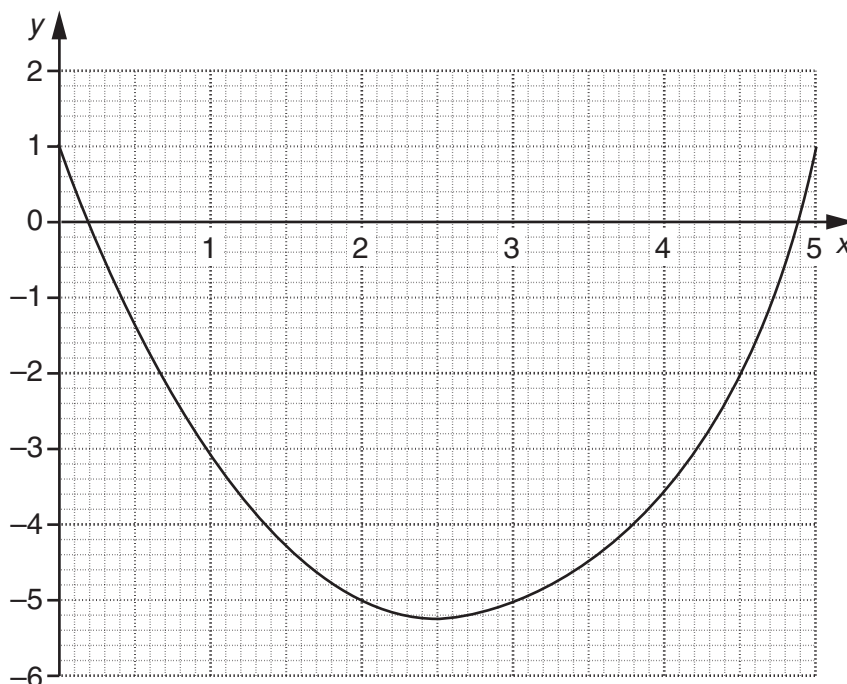
(a) _____ [2]

(b) $(x + 3)(x + 5)$

.....

(b) _____ [2]

16 The diagram shows the graph of $y = x^2 - 5x + 1$.



(a) Write down the equation of the line of symmetry of the graph.

(a) _____ [1]

(b) Use the graph to find the smallest value of $x^2 - 5x + 1$.

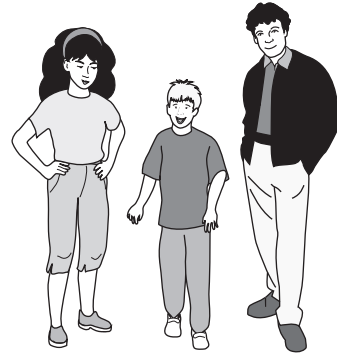
(b) _____ [1]

(c) Use the graph to find the solutions of the equation

$$x^2 - 5x + 1 = 0.$$

(c) _____ [2]

- 17 Rebecca, Chen and Ian are cousins.
Rebecca is x years old.
Chen is 4 years older than Rebecca.
Ian is 6 years younger than Rebecca.
The total of the three ages is 40 years.



Use algebra to work out the ages of the three cousins.

Rebecca _____ years

Chen _____ years

Ian _____ years [4]

18 (a) Write each of the following as a single power of 2.

(i) $2^3 \times 2^4$

(a)(i) _____ [1]

(ii) $\frac{2^8}{2^2}$

(ii) _____ [1]

(b) (i) Write 23 700 000 in standard form.

(b)(i) _____ [1]

(ii) Write 5.03×10^{-4} as an ordinary number.

(ii) _____ [1]

(c) This sign is on the road from Newtown to Oldsfield.
Work out how far it is between the two towns using this road.



.....

.....

.....

(c) _____ miles [3]

(d) Tom worked out that each day at school he walked $2\frac{3}{8}$ miles.
How far did he walk altogether in 5 school days?



.....

.....

.....

.....

.....

(d) _____ miles [3]

19 In the following expressions L , W and H are all lengths.
Decide, for each of the expressions, whether it could represent a length, an area or a volume.

(a) LWH

.....

(a) _____ [1]

(b) $L + W + H$

.....

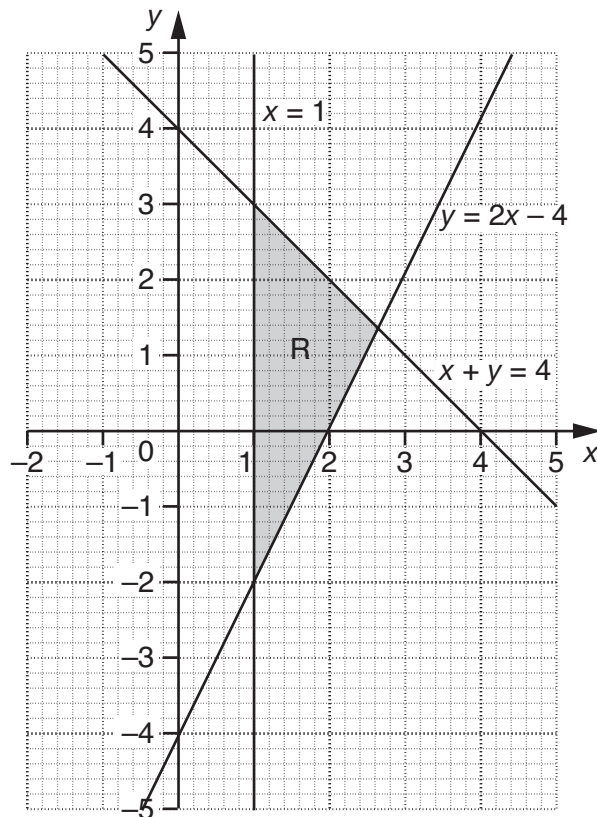
(b) _____ [1]

(c) $LW + WH + HL$

.....

(c) _____ [1]

20

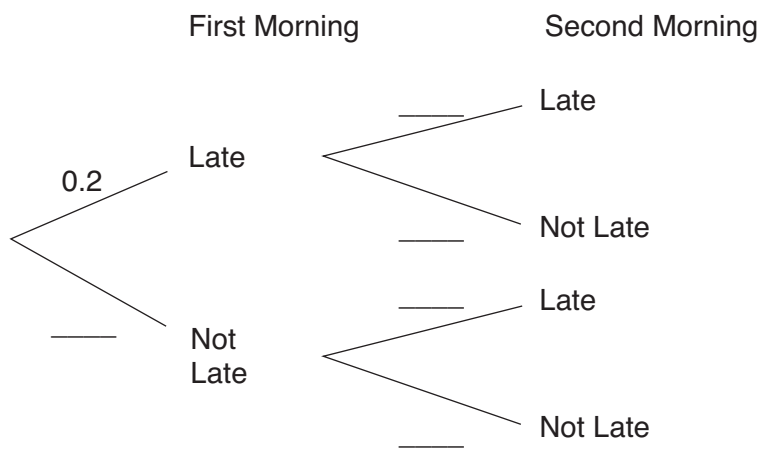


Write down the three inequalities which define the shaded region R shown on the grid above.

_____ [3]

21 On any morning the probability that the school bus is late is 0.2.

(a) Complete the tree diagram below to show the probabilities of the school bus being late on two consecutive mornings.



[2]

(b) Use the tree diagram to work out the probability that the school bus is not late on the first morning **and** not late on the second morning.

.....

.....

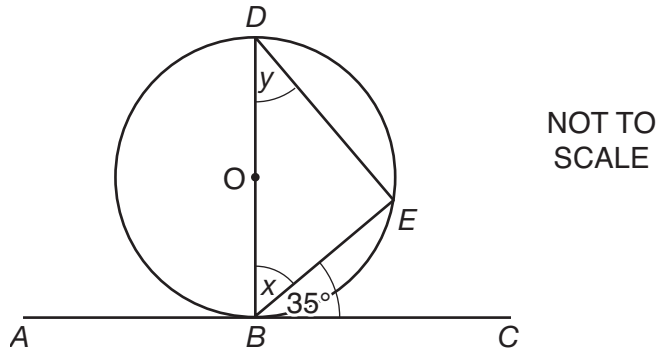
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.....

(b) _____ [2]

- 22 In the diagram, ABC is a tangent to the circle, centre O .
 BD is a diameter.
 Angle $EBC = 35^\circ$.



- (a) Work out angle x .
 Give a reason for your answer.

.....

 $x = \underline{\hspace{2cm}}$ $^\circ$ because $\underline{\hspace{4cm}}$
[2]

- (b) Work out angle y .
 Give reasons for your answer.

.....

 $y = \underline{\hspace{2cm}}$ $^\circ$ because $\underline{\hspace{4cm}}$
[3]

- 23 In each part give one example to show that the statement is **false**.
 You must show your working.

- (a) For every non-zero number y , $2y > y$.

.....
[1]

- (b) For every non-zero number x , $x^2 > x$.

.....
[2]

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