BLOCK 6 TEST

NAME		TOTAL MARKS	PERCENTAGE

Calculators may be used.

1. (a) Expand and simplify $(x + 2)(x + 4)(x + 1)$

....
(Total 3 marks)

(b) Expand and simplify $(2x + 1)(x + 2)(x + 3)$

....
(Total 3 marks)

2. There are 52 cards in a deck.
Peter is going to give one card to Casper and one card to Kelly.

How many different ways of doing this are there?

....
(Total 2 marks)

3. A population of bacteria is increasing by 10% each hour.

Find the percentage increase in the population every three hours.

……………………..

(Total 2 marks)

4. A rectangle has a length of 21 cm, to the nearest cm, and a width of 5.3 cm, to the nearest mm.

(a) Work out the upper bound for the perimeter of the rectangle.

……………………..

(Total 2 marks)

(b) Work out the lower bound for the area of the rectangle.

……………………..

(Total 2 marks)

5. (a) Write $\sqrt{48}$ in the form $k\sqrt{3}$, where k is an integer.

....
(Total 2 marks)

(b) Write $5\sqrt{27}$ in the form $k\sqrt{3}$, where k is an integer.

....
(Total 2 marks)

6. (a) Expand and simplify $(2 + \sqrt{5})(1 - \sqrt{5})$

....
(Total 2 marks)

(b) Expand and simplify $(2 + \sqrt{3})^2 - (2 - \sqrt{3})^2$

....
(Total 2 marks)

7. (a) Make x the subject of the formula $2x + a = b(x – 2)$
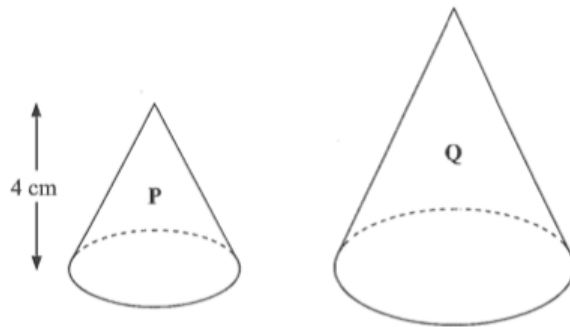
…………………………..
(**Total 3 marks**)

(b) Make x the subject of the formula $\frac{a}{b} = \dfrac{2x}{x+5}$

…………………………..
(**Total 3 marks**)

8. Prove algebraically that the recurring decimal $0.4\dot{7}$ can be written as $\dfrac{43}{90}$

…………………………..
(**Total 2 marks**)

9.

Two cones, P and Q, are mathematically similar.

The total surface area of cone P is 24 cm^2.
The total surface area of cone Q is 96 cm^2.

The height of cone P is 4 cm.

(a)   Work out the height of cone Q

…………………………..
(Total 3 marks)

The volume of cone P is 12 cm^3.
(b)   Work out the volume of cone Q
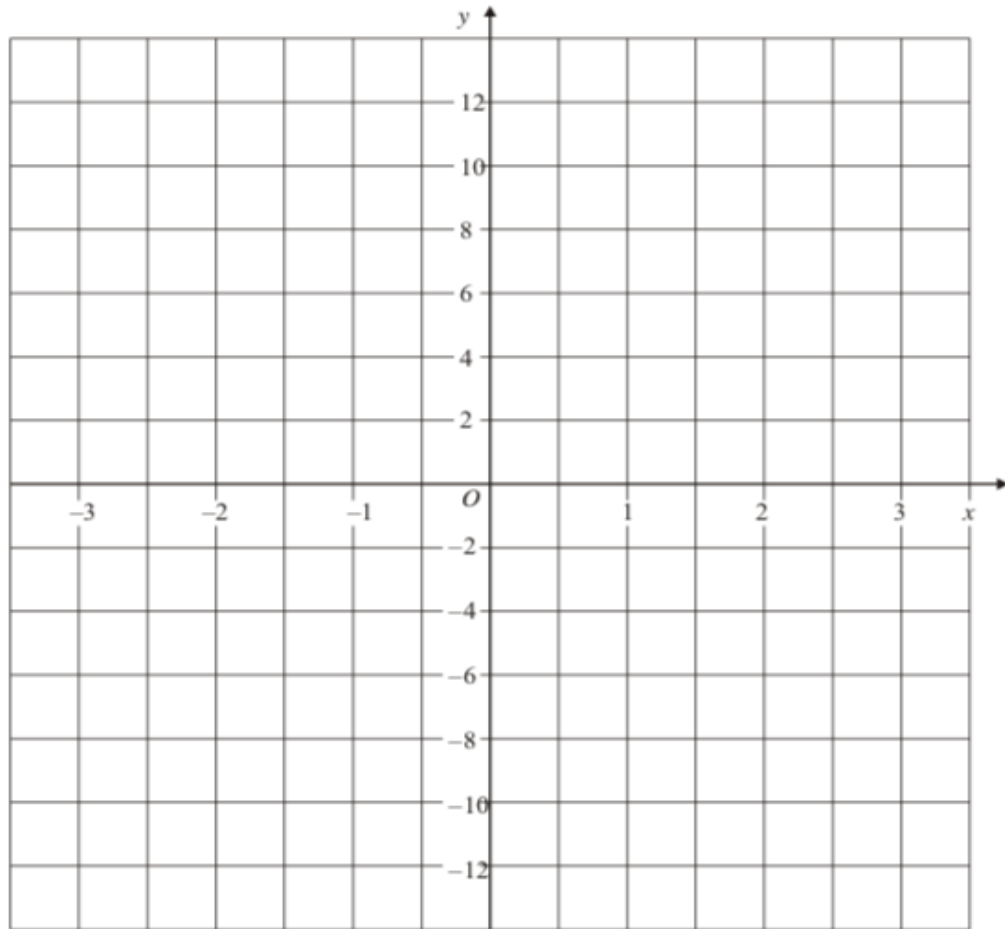
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(Total 3 marks)

10. On the grid, shade the region that satisfies all three of these inequalities

$$y > -4 \qquad x < 2 \qquad y < 2x + 1$$

(Total 4 marks)

11. A circle's radius is increased by 8%.
Find the increase in the circle's area.
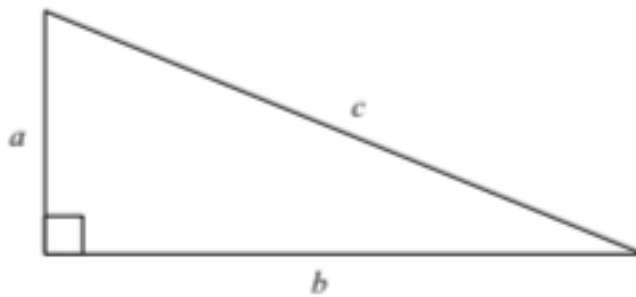
....
(Total 4 marks)

12. There are 20 people in a room.
Each person shakes each other person's hand once.

Work out the number of handshakes that take place.

…………………………..
(Total 2 marks)

13.

a = 5.3 cm correct to the nearest mm
b = 8.2 cm correct to the nearest mm

Calculate the lower bound for c.

You must show all your working.
Give your answer to three significant figures.

…………………………
(Total 4 marks)