**Question 1** Find the area

3 cm

12 cm

8 cm

3 cm

**Question 2** Find the value of length q

*9*

*q*

Question book of 18 pages including a formula sheet and a **multiple choice answer sheet. These should be detached at the start of the exam.**

Working space is provided throughout the book or use loose paper provided. You may bring one bound set of notes into the exam.

A CAS should be used. A scientific calculator may also be used.

You should have at least one pencil/pen, a ruler and an eraser.

The Task.

Ensure you write your name and teachers name on the front of this booklet and on the multiple choice answer sheet.

Answer all questions.

Fill in the correct answer box for the multiple choice questions. Extended answer questions should be answered in the space provided. Marks will be given for correct answers in multiple choice questions. Show required working out in extended answer questions.

**At the end of the exam**

Hand in the whole exam booklet and the multiple choice answer sheet.

*s*

*5*

**Question 3** A hemisphere has diameter of 4cm find its volume

**Question 4** Find the unknown values of the following

b°

*8cm*

12cm

72°

*a*

9.2cm

42°

*7cm*

a

**Question 5**

A plane at P begins its descent at angle of depression 20°. If the distance from A to B is 20km, then the distance from h in km is closest to:

h

θ = 20°

20km

**Question 6**

1. Conventional bearing S30°E in terms of true bearing.
2. True bearing 319° in terms of conventional bearing.

**Question 7**

A block of land is triangular in shape.

The 3 sides measure 30m, 60m and 40m.

1. Find the semi perimeter (s)
2. Find the area.

**Question 8** A triangle is has a side that is 3.7m and another side that is 8.8m. The angle opposite to the 3.7m side is 23 degrees. Find the length of the other side.

**Question 9** A triangular roofing frame has dimension 5m, 6m and 7m. Find all angles within the triangle.

**Question 10**

The area of the shaded region in the diagram

8cm

20cm

**Question 11**

The following triangles are similar. The value of is equal

8.8 cm

3.7 cm

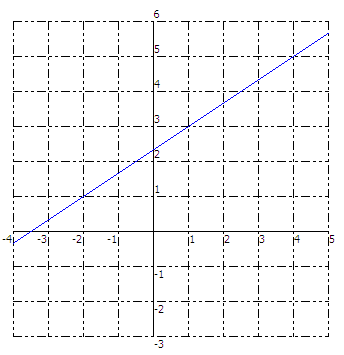
e

10 cm

**Question 12** The line with equation y = - x + 7 has gradient and y-intercept respectively is

|  |
| --- |
| **Question 13** The gradient of the line between the points  (2, 7) and (–2, –4) is: |

**Question 14** Equation of the straight line shown is by find two points.



**Question 16** The equation of the line passes through the point (3,2) and the parallel to the x axis is given by

1. Draw the graph
2. Find the equation of the

**Question 15** To rent a mower from a hire company, there is an initial charge of $7 and then an additional charge of $4.50 per hour. If C is the cost in dollars and t is the time in hours, then the formula connecting C and t is

**Question 16** A builder's fee, C dollars, can be determined from the rule *C* = 48 + *20n,* where *n* represents the number of hours worked. According to this rule the builder's fee

a) Per hours b) 8 Per hours

**Question 17** The cost of manufacturing a number of frying pans consists of a fixed cost of $400 plus a cost of $50 per frying pan. The manufacturer could break even by selling how many frying pans at what price?



**Question 19** Use matrix technique to solve the following simultaneous equation, show all working out.

X+ 2y =3

3x –y =4

**Question 20** A garage (as shown below) with one roller door is to be painted on the outside (including the roof).

2m

10m

5m

1. Calculate the surface area to be painted not including the roller door (8m2 for the area of the roller door). (2)
2. How many litres of paint are required if one litre covers 20m2. (1)
3. How many cans of paint are required if each can contain 2 litres? (to the nearest can)
4. How much will the paint cost if each can cost $25? (1)

**Question 21**



An allotment of land contains a communications tower, PQ.

Point S, Q, T are situated on level ground

From S the angle of elevation of P is 30 degrees

Distance SQ is 100 metres.

Distance TQ is 70 metres.



1. Determine the height, PQ, of the communications tower.

Write your answer, in metres, correct to one decimal place. (1)

1. Determine the angle of depression of T from P.

Write your answer, in degrees, correct to one decimal place. (2)

**Question 26** A manufacturer sells three products, *A, B* and *C,* through outlets at two shopping centres, Eastown (E) and Noxland *(N).* The number of units of each product sold per month through each shop is given by the matrix *Q,* where



Write down the order of matrix *Q. (1)*

The matrix *P,* shown below, gives the selling price, in dollars, of products *A, B, C*

*.*



1. Evaluate the matrix *M,* where *M= QP*
2. What information does the elements of matrix *M* provide? (2)
3. Explain why the matrix *PQ* is not defined. (1)

**Question 27** Budget Meats offers three types of barbeque packs:

|  |  |  |  |
| --- | --- | --- | --- |
|  | TYPES OF MEAT  Type of meat | | |
| Pack | Chops | Hamburgers | Sausages |
| Family pack (F) | 2 | 2 | 1 |
| Bulk pack (B) | 3 | 4 | 4 |
| Party pack (P) | 6 | 7 | 5 |

The cost price of the family packs $9.40, $22.90 for the Bulk pack and $35.6 for the Party pack.

1. If the cost price of each chop, hamburger and sausage is x, y, z dollars respectively write a matrix equation, of the form below, that you can solve to find the value of x,y and z. (4)



1. Write down an inverse matrix that can be used to solve these equations. (2)
2. Thus solve for x,y and z and state the cost of each drop, hamburger and sausage. (2)