Teck Whye Secondary School
End of the Year Examination
Mathematics
Paper 1

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SECTION A (50marks)

1) Express :

a) $\frac{4}{45}$ as a percentage,

b) $18\frac{4}{5}\%$ as a fraction in its simplest form,

c) the ratio of 8 months to 2 years 4 months as the ratio of two integers in its simplest form.

Answer a) _____ %[1]

b) _____ [1]

c) _____ [1]

2) Calculate $\frac{4.94}{\sqrt[3]{8.57-3.35}+7.8}$ and give your answer correct to 2 significant figures.

Answer _____ [1]

3) The exact answer to a calculation is 42.3892. James gives his answer, correct to 3 significant figures as 42.4. Calculate the difference between these two values as a percentage of the exact value.

Answer _____ %[1]

4) Arrange the following in descending order :

$$\frac{22}{7},\ \pi,\ 2\sqrt{3},\ -\sqrt{2}\times\sqrt{8}$$

Answer _____ [1]

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5) The temperature in a freezer was $-13°C$ and the room temperature outside the freezer was $27°C$. A piece of frozen chicken was taken out from the freezer and defrosted at room temperature for 20 minutes. Assuming its temperature rose at a constant rate for 20 minutes, find :
   a) the difference between these two temperatures,
   b) the average of the two temperatures,
   c) the number of minutes the frozen chicken took to reach $-2°C$ from the moment it was taken out from the freezer.

Answer a) _____ °C [1]

b) _____ °C [1]

c) _____ minutes[2]

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6) Given that $198 = 2 \times 3^2 \times 11$,
   a) Express 90 as a product of its prime factors in index notation,
   b) Hence, find the highest common factor of 198 and 90,
   c) Find the smallest integer, ***a***, such that 198***a*** is a perfect square.

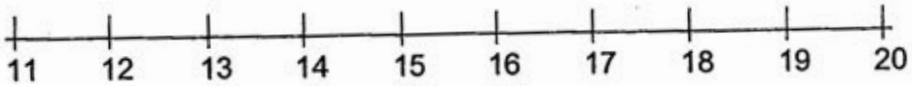
Answer a) _____ [1]

b) _____ [1]

c) ***a*** = _____ [1]

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7) Given that ***y*** is a prime number between 11 and 20, indicate clearly, with a dot or cross, the possible values of ***y*** on the following number line :



[1]

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8) A sum of award was divided between Ann, Beatrice and Carol in the ratio of 2 : 3 : 4.
If, this money has been divided equally between them, Ann would have received an extra $20. What was the total sum of money ?

Answer $_____ [2]

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9) Tom walks 1000m at an average speed of 4km/h and then runs 1.3km in 5 minutes. Calculate
   a) the time, in hour, he takes to walk the 1000m,
   b) his running speed in km/h,
   c) his average speed for the whole distance.

Answer a) _____ hour [1]

b) _____ km/h [1]

c) _____ km/h [2]

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10) A solid cube has a total surface area of 726 cm^2. Find
   a) the length of each edge of the cube and
   b) the volume of the cube.

Answer a) _____ cm [1]

b) _____ cm^3 [1]

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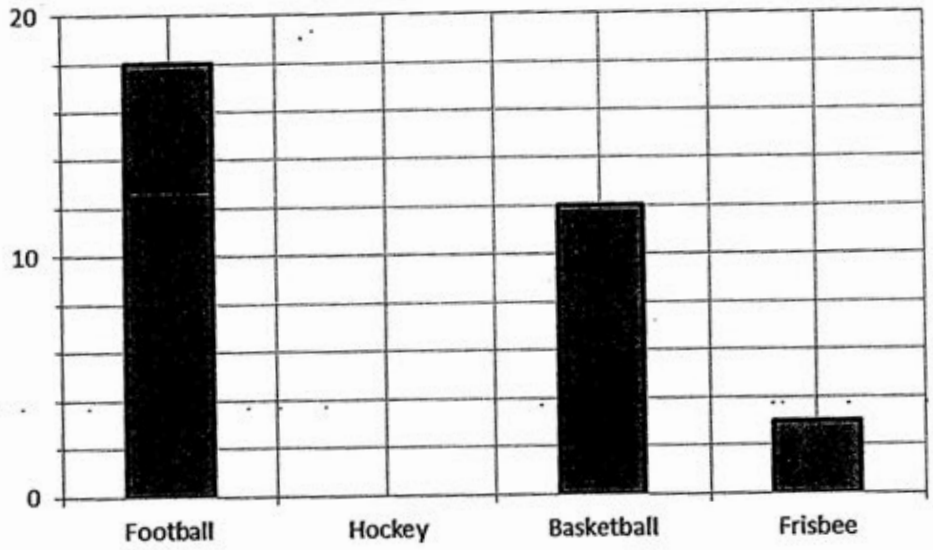
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11) The following partially completed bar chart shows the number of students for each sport in a class of 40.

a) Complete the bar chart.

b) Find the fraction of the students who chose basketball. Give your answer in its simplest form.

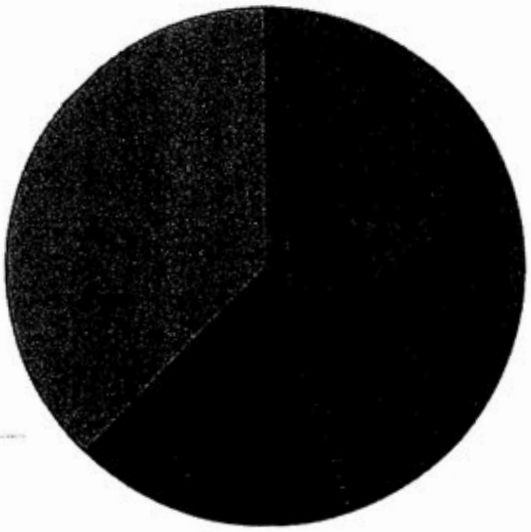
c) Find the percentage of students who chose football.



d) The results of the survey are also to be shown in a pie chart.

i) Calculate the angle representing basketball and

ii) Complete the following pie chart.



Answer a) as per bar graph [1]

b) _____ [1]

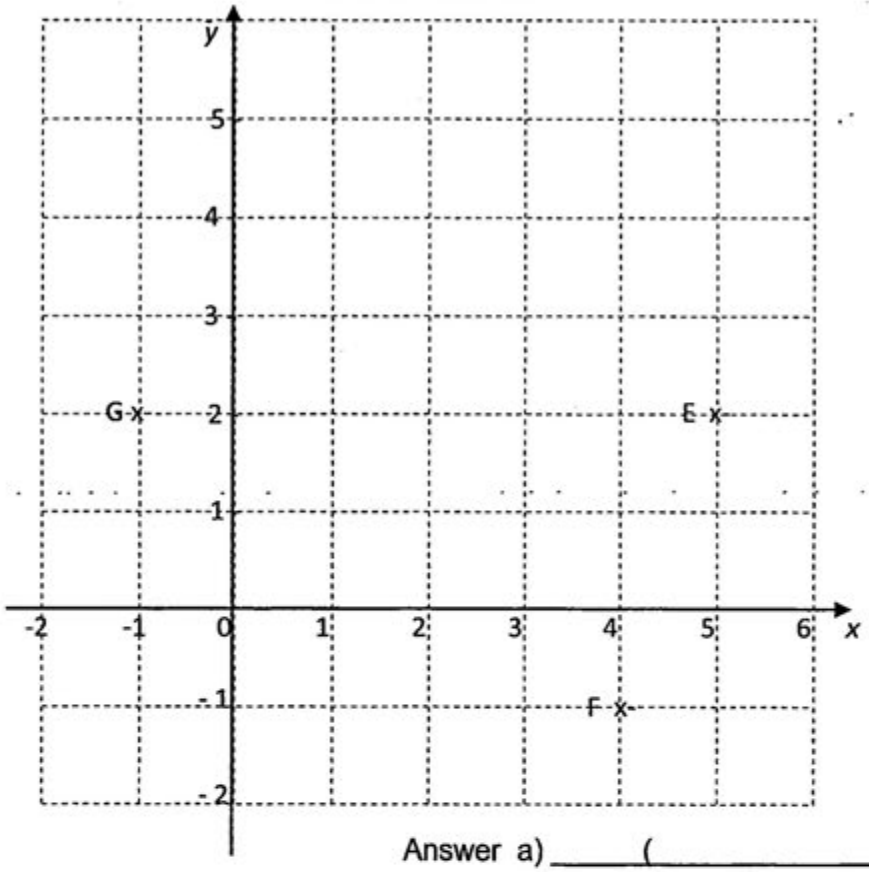
c) _____ % [1]

d)i) _____ ° [1]

ii) as per pie chart [1]

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12) In the diagram, the points E, F and G are marked.
   a) Write down the co-ordinates of point F
   b) Calculate the area of triangle EFG.
   c) The point H is such that EFGH is a kite. Mark the point H on the diagram.



Answer a) _____(_____)[1]

b) _____unit^2 [1]

c) as indicated in the diagram [1]

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13)
   a) Mrs Tan bought a painting for $120 and resold at $540 one year later . Find the percentage increase in its value.
   b) Mr Ho paid $840 for the television set after a 20% discount. Find the original price of the television set.

Answer a) _____% [2]

b) $_____[2]

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14) If $a = 3, b = -4$ and $c = -2$ evaluate $\dfrac{3a - b^2}{2c}$

Answer _____[1]

15) Simplify the following expressions :

a) $3(y+2) - (2y+1)$

b) $x^2 + \frac{2}{3}x^2 - \frac{4}{5}x^2$

Answer a) _____[2]

b) _____[1]

16) Express each of the followings as a single fraction in its simplest form :

a) $\dfrac{x+3}{2} - \dfrac{2x+1}{5}$

b) $\dfrac{3b^2}{4} \div \dfrac{12b}{5c}$

Answer a) _____[2]

b) _____[2]

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17) Solve the following equations :

a) $2y - 7 = -21$

b) $\frac{x+2}{3} = 10 - 2x$

Answer a) y = _____ [2]

b) x = _____ [2]

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18) Factorise the following expressions :

a) $2x^2 - 50xy$

b) $5a(2c - d) - (2c - d)$

c) $3xy - 2ab - ay + 6xb$

Answer a) _____ [1]

b) _____ [1]

c) _____ [2]

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SECTION B (50 marks)

19)

a) There are 48 chocolate bars and 72 sweets. Both the chocolates and sweets are to be distributed equally into goodie bag. Find :
   i) the maximum number of goodie bag and
   ii) the number of chocolate bars in one goodie bag.

b) Mr Tan, Mr Shiva and Mr Jamil are bus drivers who reports work at Choa Chu Kang terminal.
Below shows the bus they are driving and the duration taken for them to go back to the Choa Chu Kang Terminal again. Assuming all three drivers leave their terminal at 0530 hours, what is the next earliest time that three of them can meet back at the terminal ?

	Bus Service	Duration
Mr Tan	A	2 hours
Mr Shiva	B	45 minutes
Mr Jamil	C	1 hour 30 minutes

Answer a)i) _____ [2]

ii) _____ [1]

b) _____ [3]

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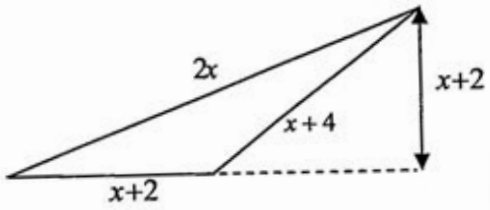
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20)

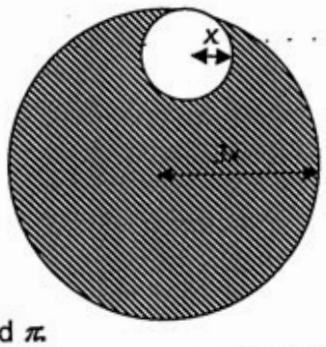
a) The lengths of the sides of a triangle are $2x$ cm, $(x+2)$ cm and $(x+4)$ cm

i) Write down and simplify an expression for the perimeter the triangle.

ii) Given that perimeter is 18cm , find its area.



b) The two circles shown have radii x and $3x$.



Find

i) the area of the shaded region in terms of x and π.

ii) the ratio of the circumference of large circle to the sum of circumferences of the two circles.

Answer a)i)_____[1]

ii)_____[2]

b) i)_____[2]

ii)_____[2]

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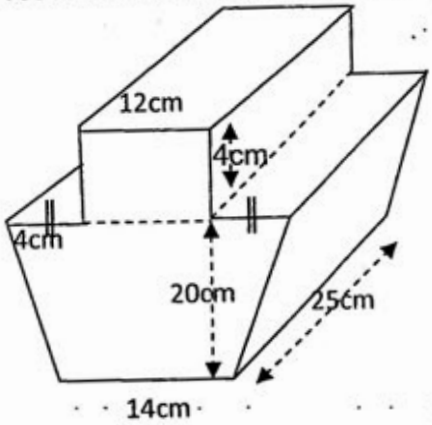
21) The following water tank is filled to the brim with water.

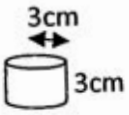
a) Find the volume of water in the tank.

b) All the water in the tank is poured into cylindrical cups of radius 3cm and height 3 cm. Find the volume of one cup.

c) Hence, find the minimum number of cups required to contain all the water in the tank.

d) If the water in the tank is to fill up exactly 4 identical containers of uniform cross-sectional area of $31.5cm^2$, find the height of one such container.





Answer a) _____ [2]

b) _____ [2]

c) _____ [2]

d) _____ [2]

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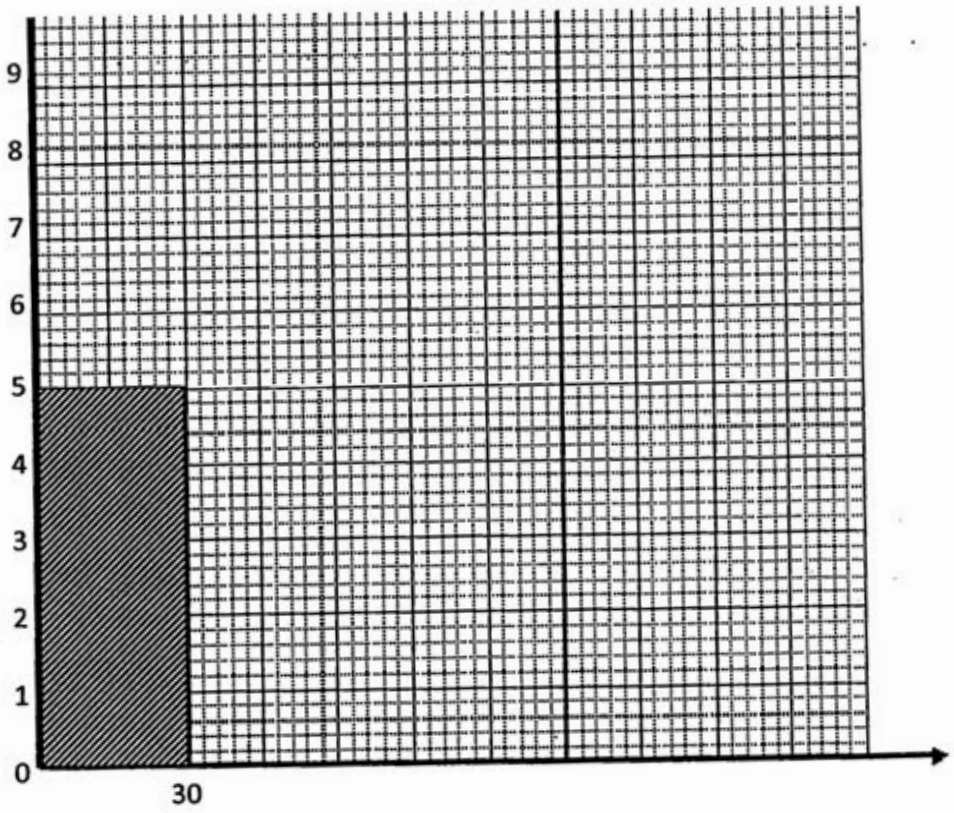
22) The following shows the parking time in minutes for 20 cars :

5	35	70	100	110
120	60	80	50	20
10	30	55	75	90
65	85	9	90	85

a) Complete the tally chart below to organise the data. [2]

Parking Time (mins)	Tally	Frequency
$0 < x \leq 30$	////	5
$30 < x \leq 60$		
$60 < x \leq 90$		
$90 < x \leq 120$		

b) Draw a histogram to represent the above data. [2]



c) If there is no charge for parking less than 10 minutes, calculate the percentage of cars need to pay the parking fees.

Answer c) _____ [1]

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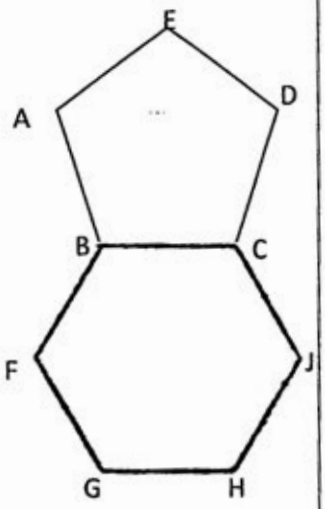
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23) The diagram shows certain part of a repeated pattern. It consists of regular pentagon ABCDE and regular hexagon BFGHJC. Find

a) one interior angle of the pentagon

b) ∠BCJ

c) ∠ABF



Answer a) _____ [1]

b) _____ [1]

c) _____ [1]

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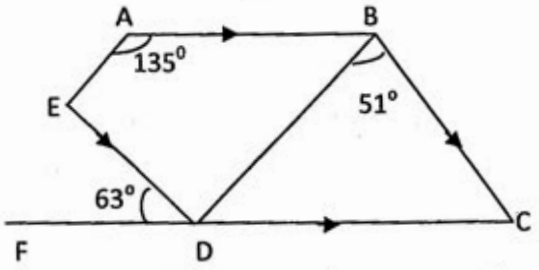
24) In the diagram, AB is parallel to FDC and BC is parallel to ED. Given the angles marked in the diagram, find the value of

a) ∠BCD,

b) ∠ABD,

c) ∠AED.

(Please indicate the reasons in your working when appropriate.)



Answer a) _____ [1]

b) _____ [1]

c) _____ [2]

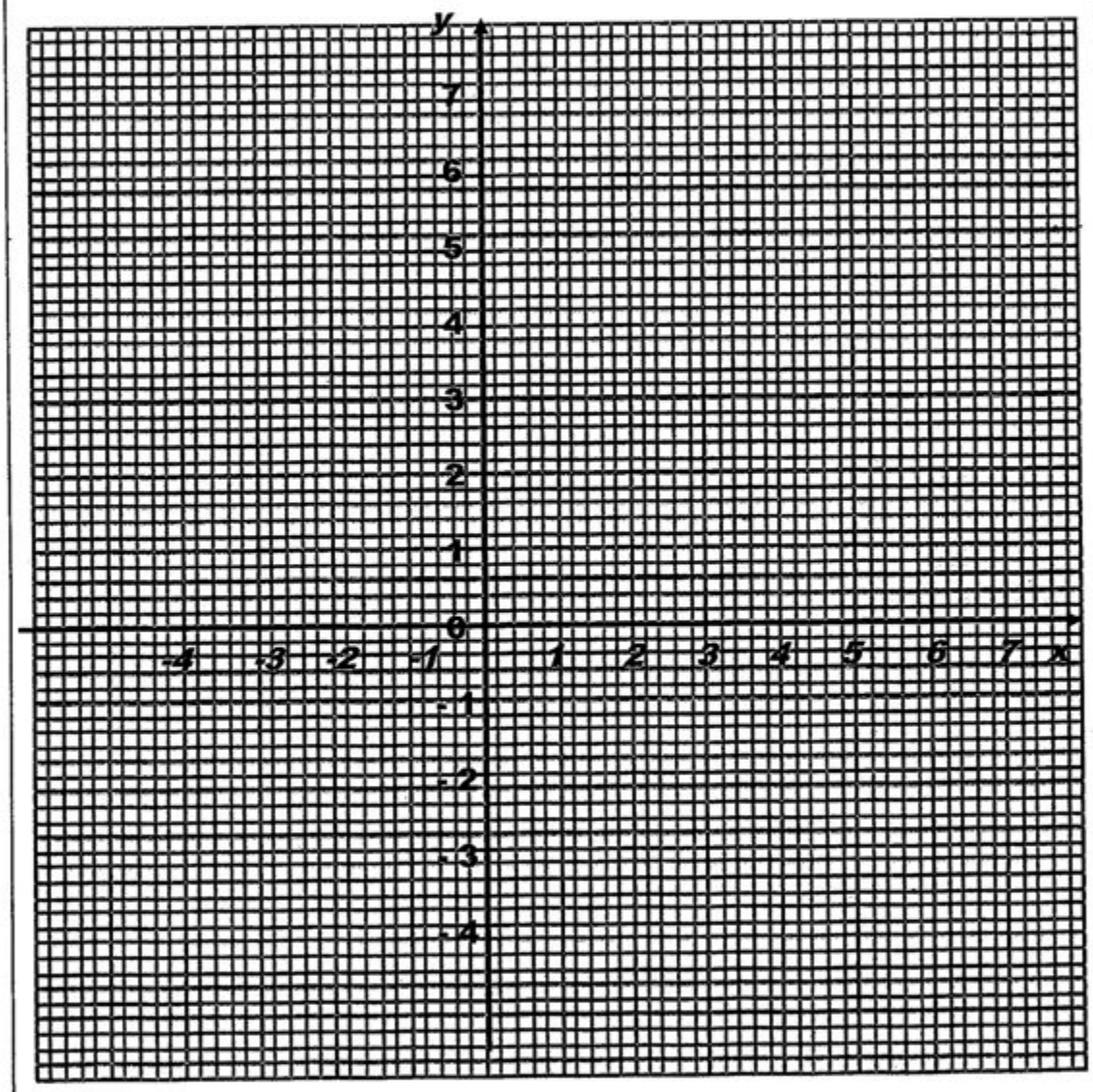
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25) The line $y - 2x = -4$ passes through the following points :

x	0	1	5
y	−4	−2	r

a) Find the value of r.
b) On the axes given below, draw the line the line $y - 2x = -4$.
c) From the graph, find the value of x when $y = 1$.
d) Calculate the gradient of the line $y - 2x = -4$.
e) On the same graph, draw the line $x = 3$.
f) Hence, write down the coordinates of the point where $y - 2x = -4$ and $x = 3$ meet.



Answer a) r = _____ [1]

b) as per graph _____ [1]

c) x = _____ [1]

d) Gradient = _____ [1]

e) as per graph _____ [1]

f) (_____) [1]

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26) The normal price of a ream of 500 sheet of plain paper is $5.40.
The normal cost of printing 500sheet of notes is $44.60.

a) Show that the total cost of each sheet of printed notes is 10 cents.

b) Shop A offers '4 reams of paper for the price of 3'. The price of printing 500 sheets of notes remains at $44.60.
Mr Koh bought 4 reams of paper and used all to print the Mathematics notes at A.
Calculate how much each sheet of printed note costs him, correct to the nearest cent.

c) Shop B keeps the price of each ream of 500 sheet of plain paper at $5.40. It offers a 20% reduction off the normal price for printing the notes.
Mrs Soh bought 1 ream of paper and used all to print the Science notes at B.
Calculate how much each sheet of printed note costs her, correct to the nearest cent.

d) Mr Ahmad, bought 4 reams of paper at shop A and have his Geography notes printed at Shop B.
i) By comparing the cost of each printed sheet, who gets the cheapest rate? Explain with your calculations.
ii) Calculate the percentage reduction in the cost of each sheet of notes compared to (a).

Answer a) as per workings [2]

b) _____ [3]

c) _____ [2]

d)i) _____ [2]

ii) _____ [1]

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