# SYDNEY GIRLS HIGH SCHOOL

## YEAR 8 MATHEMATICS

## YEARLY EXAMINATION

## November 2007

## Time allowed: 75 minutes

**Instructions:**

- There are Five (5) questions. Questions are of equal value.
- Attempt all questions.
- Show all necessary working. Marks may be deducted for badly arranged work.
- Start each question on a new page. Write on one side of the paper only.

Name: _____

## Question One (20 marks)

a) If $a = 3b + 2$, Find $b$ when $a$ is 20.

b) Solve the following equations

i) $2n - 6 = 3$

ii) $4(t + 5) = 16$

c) Lara mixes 10 litres of white paint with 4 litres of yellow paint to get the colour she wants.

Find the ratio of

i) Yellow paint to white paint

ii) White paint to the total amount of paint in the mixture

d) Simplify the following ratios

i) 18:27

ii) 1.8 : 0.2

e) A car travels 270 km on 30L petrol. How far does it travel on 20L?

f) Nutri dog food contains meat and cereal in the ratio 4:17.During production at the factory one day 4000kg of meat was used to make the dog food. How much cereal was used?

g) A machine produces 32 toys per hour. Find the number of toys produced at this rate in

i) 5 hours

ii) 15 min

h) Find the length of a real object in metres if the scale drawing length is 9cm and the scale is 1: 250

i) Find the area of a circle with radius 8 cm.(correct to two decimal places)

j) Does the point (3,-2) lie on the line $y = 3x - 11$ ?

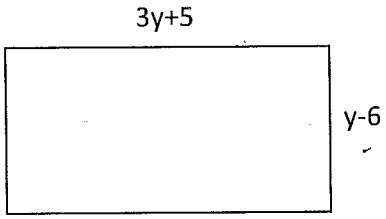
## QUESTION TWO (20 marks)

a) Solve the following equations

i) $\frac{6-x}{7}=4$

ii) $\frac{w}{4}+3=-5$

b) The perimeter of the following rectangle is 118 cm. Find its dimensions.




c) Solve the following inequalities and graph the solution on a number line

i) $3x-5>4$

ii) $6-x\leq 4$

d) If $s=ut+\frac{at^2}{2}$, find a when $s=150$, $u=10$ and $t=6$.

e) Simplify this ratio

$\frac{7}{8}:2\frac{1}{3}$

f) Express the following ratios in the simplest form

i) 60 c to $4

ii) 4 days to 6 weeks

g) The ratio of three angles of an scalene triangle is 3:2:1.The smallest angle is $30^{\circ}$.What is the size of the largest angle?

## QUESTION THREE (20 marks)

a) Solve the following equations

i) $2(k+2)+3=39$

ii) $5n+4=n+24$

b) Paris has a packet of 45 smarties that she is going to share with Justin in the ratio of 4:5. How many smarties will each receive?

c) Divide 4m in the ratio 9:11

d) What is the scale if 1mm represents 2.5 m?

e) Find the circumference of a circle with diameter 21 cm. Answer correct to two decimal places.

f) For the data shown below find

22 25 17 45 25 43 29 25

i) Range

ii) Median

iii) Mode

iv) Mean

g) Express the following rate in its simplest form

880L/22s

h) Graph the following lines on the same number plane

i) $y=2$

ii) $y=5-x$

## QUESTION FOUR (20 marks)

a) Change 54L/hr to mL/min.

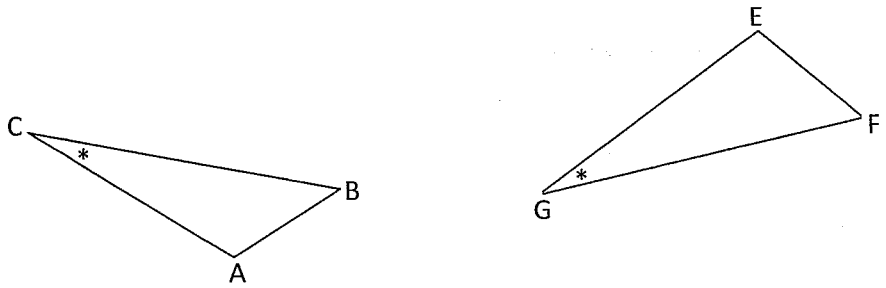
b) Solve $\frac{35}{50} = \frac{7}{x}$

c) Write an equation and solve

i) The prices of two chocolate bars differ by75 cents. Their total cost is $4.05.What is the cost of the more expensive chocolate bar?

ii) Julia is 35 years older than her daughter Jenny. The sum of their ages is 57 years. What will be Jenny's age in 5 years?

d) Δ ABC is congruent to Δ EFG. Which side of Δ EFG matches AC?




e) For the data shown below find

i) mode

ii) range

iii) mean

iv) ~~range~~ median

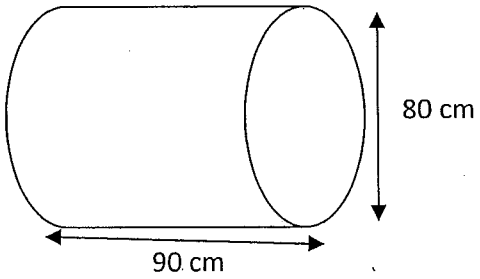
| Score | frequency |
|---|---|
| 2 | 4 |
| 3 | 12 |
| 4 | 18 |
| 5 | 16 |
| 6 | 8 |
| 7 | 2 |

v) Draw a frequency histogram and polygon for the data shown above.

f) For the following cylinder

i) Calculate the volume in $m^3$. Give the answer correct to two decimal places.

ii) What is the capacity of the cylinder in kL.



## QUESTION FIVE (20 marks)

a) For the following data find

i) Mean

ii) Mode

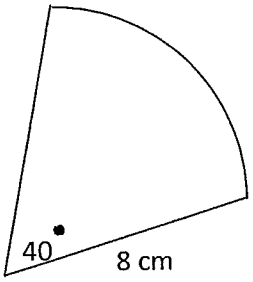
iii) Median

iv) Range

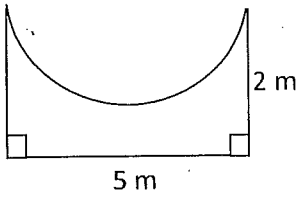
| Stem | Leaf |
|---|---|
| 4 | 4 5 7 |
| 5 | 1 3 4 6 |
| 6 | 0 2 2 |
| 7 | 3 9 |
| 8 | 6 |

b) Find the perimeter of the following figures (correct to 1 decimal place)

i)

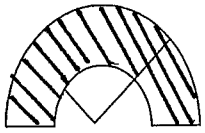



ii)




c) Find the shaded area in the following figures (answers correct to 2 decimal places)

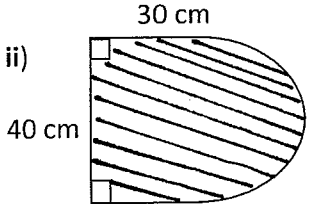
i)



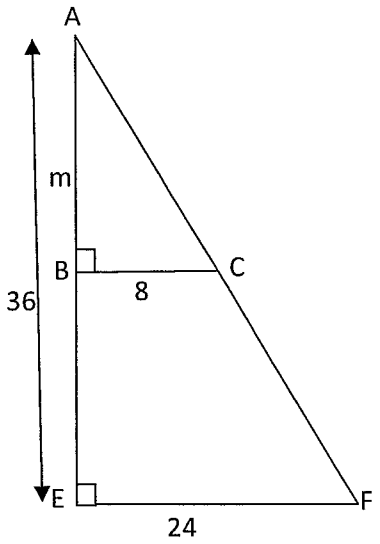
Radius of the larger arc = 90 cm

Radius of the smaller arc = 40 cm

ii)



d) Given that Δ ABC is similar to ΔAEF, find the value of the pronumeral




e) Expand and simplify where possible

i) $8a-3(a+7)$

ii) $2y(2y-5)-5(2y+5)$

iii) $(2m-7)(2m+7)$

iv) $(7-2m)^2$

v) $\left(m-\frac{1}{m}\right)\left(m+\frac{1}{m}\right)$

**The End**

# SYDNEY GIRLS HIGH SCHOOL

98%

Excellent effort!

## YEAR 8 MATHEMATICS

## YEARLY EXAMINATION

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**Name:** Moaz Mohib 8X

## Question One (20 marks)

a) If $a = 3b + 2$, Find $b$ when $a$ is 20. $3b+2=20$, $-2\ -2$, $3b=18$, $b=6$ ✓

b) Solve the following equations

i) $2n - 6 = 3$
$2n = 9$
$n = 4\frac{1}{2}$ ✓

ii) $4(t+5) = 16$
$4t+20 = 16$ $-20\ -20$
$4t = -4$
$t = -1$ ✓

c) Lara mixes 10 litres of white paint with 4 litres of yellow paint to get the colour she wants.

Find the ratio of

i) Yellow paint to white paint
4:10
2:5 ✓

ii) White paint to the total amount of paint in the mixture
10:14
5:7 ✓

d) Simplify the following ratios

i) 18:27
6:9
2:3 ✓

ii) 1.8 : 0.2
18 : 1
9 : 1 ✓

e) A car travels 270 km on 30L petrol. How far does it travel on 20L?
30L = 270km
1L = 9km
∴ 20L = 180km ✓

f) Nutri dog food contains meat and cereal in the ratio 4:17. During production at the factory one day 4000kg of meat was used to make the dog food. How much cereal was used?

$4:17 = 4000:x$
$\frac{4}{17} = \frac{4000}{x}$
$4x = 68000$
$x = 17000$ ✓

17000kg of cereal were used. ✓

g) A machine produces 32 toys per hour. Find the number of toys produced at this rate in

i) 5 hours
160 toys ✓

ii) 15 min
8 toys ✓

h) Find the length of a real object in metres if the scale drawing length is 9cm and the scale is 1: 250

250 × 9
= 2250cm
22.5m ✓

i) Find the area of a circle with radius 8 cm.(correct to two decimal places)

$\pi \times 8^2$
$= 201.06cm^2$ ✓

j) Does the point (3,-2) lie on the line $y = 3x - 11$?

$9 - 11 = -2$

$3 \times 3 - 11 = -2$

∴ (3,-2) lies on line $y = 3x - 11$ ✓

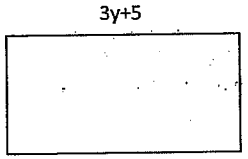
## QUESTION TWO (20 marks)

a) Solve the following equations

i) $\frac{6-x}{7}=4$ $6-x=28-6$, $-6$, $x=-22$ ✓

ii) $\frac{w}{4}+3=-5$ $-3$ $-3$, $\frac{w}{4}=-8$, $w=-32$ ✓

b) The perimeter of the following rectangle is 118 cm. Find its dimensions.




$3y+5+3y+5+y-6+y-6=118cm$

$8y+10-12=118cm$

$8y-2=118cm$, $+2$ $+2$

$8y=120cm$ ✓

$y=15$

Length $=50cm$

breadth $=9cm$ ✓

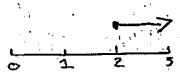
c) Solve the following inequalities and graph the solution on a number line

i) $3x-5>4$, $+5$ $+5$, $\frac{3x}{3}>\frac{9}{3}$, $x>3$ ✓


ii) $6-x\leq 4$

$-x\leq -2$

$x\geq 2$ ✓




d) If $s=ut+\frac{at^2}{2}$, find a when $s=150$, $u=10$ and $t=6$. $\frac{36a}{2}+60=150$, $-60$ $-60$

$\frac{36a}{2}=90$

$36a=180$ ✓

$a=5$

e) Simplify this ratio

$\frac{7}{8}:2\frac{1}{3}$

$\frac{7}{8}:\frac{7}{3}$ ✓

$3:8$

f) Express the following ratios in the simplest form

i) 60 c to $4

60c : 400c ✓

3 : 20

ii) 4 days to 6 weeks

4 : 42

2 : 21 ✓

g) The ratio of three angles of an scalene triangle is 3:2:1. The smallest angle is $30^\circ$. What is the size of the largest angle?

1 part $=30^\circ$

2 part $=60^\circ$ ✓

3 part $=90^\circ$

Largest angle $=90^\circ$ ✓

## QUESTION THREE (20 marks)

a) Solve the following equations

i) $2(k+2)+3=39$

$2k+4+3=39$

$2k+7=39$ $2k=32$ ✓

$k=16$

ii) $5n+4=n+24$, $-n$ $-n$

$4n+4=24$

$-4$ $-4$

$4n=20$

$n=5$ ✓

b) Paris has a packet of 45 smarties that she is going to share with Justin in the ratio of 4:5. How many smarties will each receive?

9 parts $=45$ smarties

1 part $=5$

4 part $=20$

5 part $=25$

Paris $=20$ smarties ✓

Justin $=25$ smarties

c) Divide 4m in the ratio 9:11

$4m=400cm$

$400\div 20$

$=20$

180 : 220 ✓

1.8 : 2.2

d) What is the scale if 1mm represents 2.5 m?

$1mm=2500mm$ ✓

e) Find the circumference of a circle with diameter 21 cm. Answer correct to two decimal places. $\pi\times 21=65.97cm$ ✓

f) For the data shown below find

22 25 17 45 25 43 29 25

17, 22, 25, 25, 25, 29, 43, 45

i) Range $=28$ ✓

ii) Median $=25$ ✓

iii) Mode $=25$ ✓

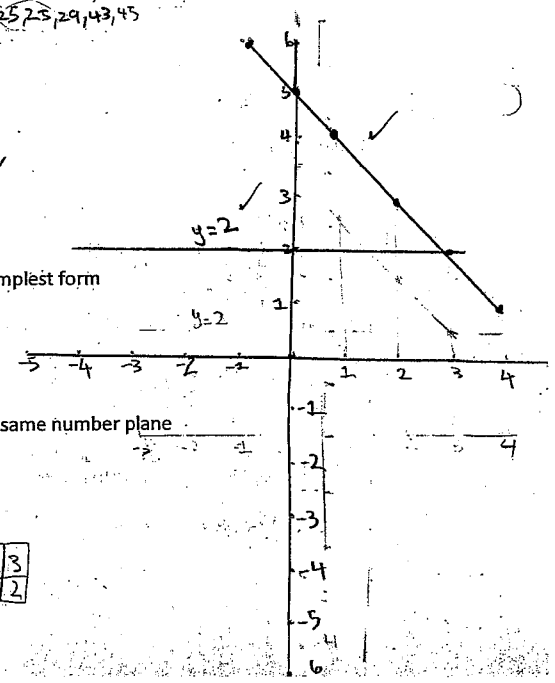
iv) Mean $=28.875$ ✓

g) Express the following rate in its simplest form

880L/22s

40L/1s ✓

h) Graph the following lines on the same number plane




i) $y=2$

ii) $y=5-x$

| x | 0 | 1 | 2 | 3 |
|---|---|---|---|---|
| y | 5 | 4 | 3 | 2 |

## QUESTION FOUR (20 marks)

a) Change 54L/hr to mL/min. 60min = 54 000ml
min = 900ml
900ml/min ✓

b) Solve $\frac{35}{50} = \frac{7}{x}$ $35x = 350$
$x = 10$ ✓

c) Write an equation and solve

i) The prices of two chocolate bars differ by75 cents. Their total cost is $4.05.What is the cost of the more expensive chocolate bar?

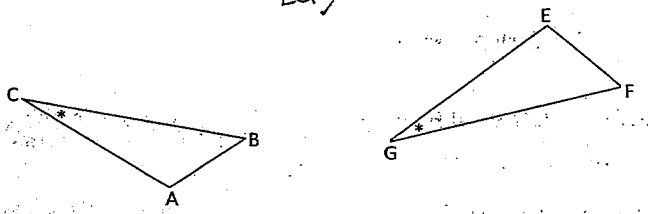
$x + x - 0.75 = 4.05$
$2x - 0.75 = 4.05$ ✓ $2.40$ ✓
$2x = 4.80$
$x = 2.40$

ii) Julia is 35 years older than her daughter Jenny. The sum of their ages is 57 years. What will be Jenny's age in 5 years?

$35 + x + x = 57$ Julia=46
$35 + 2x = 57$
$2x = 22$ ✓ Jenny=11
$x = 11$ 5yrs, Jenny's age will be=16yr ✓

d) Δ ABC is congruent to Δ EFG. Which side of Δ EFG matches AC?

EG ✓




e) For the data shown below find

i) mode = 4 ✓

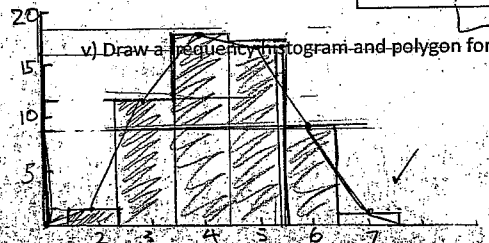
ii) range = 5 ✓

iii) mean = 4.3 ✓

iv) ~~range~~ median = 4 ✓

| Score | frequency | fx |
|---|---|---|
| 2 | 4 | 8 ✓ |
| 3 | 12 | 36 ✓ |
| 4 | 18 | 72 ✓ |
| 5 | 16 | 80 ✓ |
| 6 | 8 | 48 ✓ |
| 7 | 2 | 14 ✓ |
| | 60 | 258 |

v) Draw a frequency histogram and polygon for the data shown above.

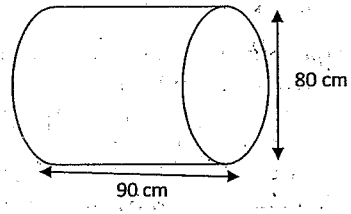



452 389.

f) For the following cylinder

i) Calculate the volume in $m^3$. Give the answer correct to two decimal places.

ii) What is the capacity of the cylinder in kL.




(i) $\pi \times 0.4^2 \times 0.9$ ✓
$= 0.45 m^3$

(ii) $0.45 m^3 = 0.45 kL$ ✓

## QUESTION FIVE (20 marks)

a) For the following data find

i) Mean = 59.4 ✓

ii) Mode = 62 ✓

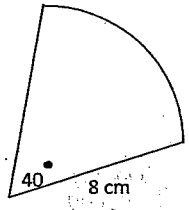
iii) Median = 56

iv) Range = 42 ✓

| Stem | Leaf |
|---|---|
| 4 | 4 5 7 |
| 5 | 1 3 4 6 |
| 6 | 0 2 2 |
| 7 | 3 9 |
| 8 | 6 |

b) Find the perimeter of the following figures (correct to 1 decimal place)

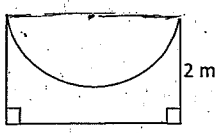
i)




$\left(\frac{1}{9}\times 2\times\pi\times 8\right)+16$

$=21.6\text{cm}$ ✓

ii)

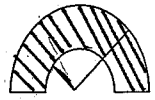



$(2+2+5)+\left(\frac{1}{2}\times\pi\times 5\right)$

$=16.9\text{m}$ (to 1 dp.)

c) Find the shaded area in the following figures (answers correct to 2 decimal places)

i)



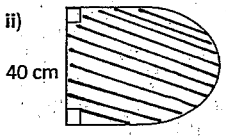
Radius of the larger arc = 90 cm

Radius of the smaller arc = 40 cm

$\left(\pi\times\frac{1}{2}\times 90^2\right)-\left(\pi\times\frac{1}{2}\times 40^2\right)$ ✓

$=10210.18\text{cm}^2$ ✓

ii)

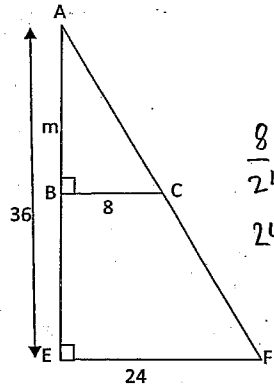



$(30\times 40)+\left(\frac{1}{2}\times\pi\times 20^2\right)$ ✓

$=1200+628.32$

$=1828.32\text{cm}^2$ ✓

d) Given that Δ ABC is similar to ΔAEF, find the value of the pronumeral




$\frac{8}{24}=\frac{m}{36}$ ✓

$24m=288$

$m=12$ ✓

e) Expand and simplify where possible

i) $8a-3(a+7)$

$8a-3a-21$

$=5a-21$ ✓

ii) $2y(2y-5)-5(2y+5)$

$=4y^2-10y-10y-25$ ✓

$=4y^2-20y-25$

iii) $(2m-7)(2m+7)$

$2m(2m+7)-7(2m+7)$

$4m^2+14m-14m-49$ ✓

$=4m^2-49$

iv) $(7-2m)^2$

$(7-2m)(7-2m)$

$=7(7-2m)-2m(7-2m)$

$=49-14m-14m+4m^2$

$=49-28m+4m^2$ ✓

v) $\left(m-\frac{1}{m}\right)\left(m+\frac{1}{m}\right)$

$m\left(m+\frac{1}{m}\right)-\frac{1}{m}\left(m+\frac{1}{m}\right)$ ✓

$m^2+1-1-\frac{1}{m^2}$

$=m^2-\frac{1}{m^2}$ ✓

$\frac{1}{m}<\frac{m}{1}$

**The End**