OUR LADY OF THE SACRED HEART COLLEGE
KENSINGTON

STUDENT – NAME .....

MATHEMATICS TEACHER ..

2011

Year 8

Mathematics

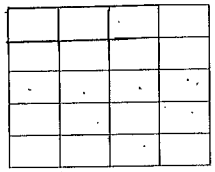
Time allowed: 45 minutes
Total marks: 40 marks

Assessed Outcomes

NS4.3	**Percentage operations**
PAS4.3	Uses the algebraic symbol system & order of operations to simplify and expand

Directions to Candidates

- **Show all working** on the paper
- Calculators may be used
- Good Luck!!

QUESTIONS Show all necessary working in the space provided Marks will be allocated for working out	MARKS
1. If 13% of students were absent on Monday, what percentage of students were present?	1m
2. Express 24% as a fraction in simplest form	2m
3. Shade 10% of this chocolate bar 	1m
4. The table below gives the favourite hobbies of 80 Year 8 students: What percentage of students enjoy Touch Football as their favourite hobby?	2m
5. Express $\frac{1}{5}$ as a percentage	1m

Favourite Hobby	Dancing	Netball	Touch Football	Swimming
Number of Students	40	20	16	4

6. Complete the sentences below by choosing the correct words:

Commission, ~~like,~~ unlike, ~~discount,~~ ~~out of one hundred,~~ coefficient

- The term PERCENT means _____
- In algebra, only _____ terms can be added or subtracted
- A _____ is a reduction in the price of an item.
- $3x$ and $5xy$ are examples of _____ terms.

4m

7. Find 12% of $950

1m

8. Circle the like terms below:

$5ab \quad 4b \quad -2a \quad 10ba$

1m

9. Simplify $6p+3p-7p=$

1m

10. Explain why $2^3 = 8$

1m

11. Simplify $p^9 \div p^5 =$

2m

(9)

12. Expand: $2(3f-4)$

1m

13. Fill in the missing terms:

a) $8pq \times \square = 56p^2qr$

1m

b) $3gh+9g = \square\,(h+3)$

1m

14. a) Find the HCF of $3bm$ and $12am$

1m

b) Factorise: $3bm+12am=$

1m

c) Factorise: $30b^2-35b$

1m

15. Simplify fully:

a) $\frac{3a}{4f} \times \frac{2f}{6a} =$

2m

b) $\frac{2m}{3} - \frac{4m}{15} =$ 2m

c) $\frac{n}{7} \div \frac{n}{3} =$ 2m

16. Circle the correct answer for $(2x)^3 =$ 1m

A $2x^3$ B $6x^3$ C $8x^3$ D $9x^3$

17. Darla works for a cosmetics company. She is paid a monthly retainer of $1500 plus a 3% commission on the value of the products she sells. This month Darla sold cosmetic products worth $16 000.

a) Calculate Darla's commission this month 2m

b) Find Darla's total earnings this month. 1m

18. Jessica bought a pair of Roxy jeans for $90 to sell in her surf shop. The jeans didn't sell by the end of the season. In the winter sale they sold for $36.

a) Find Jane's loss. 1m

b) Calculate the loss as a percentage of the cost price. 1m

18. In a school Maths exam, Michelle had to simplify : $3(4+x)-2=$
Michelle's working for this question is:

$$3(4+x)-2 = 12+3x-6$$
$$= 18-3x$$

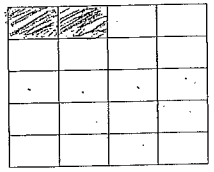
a) Explain why Michelle's answer is incorrect. (use examples from her working) 1m

b) Show Michelle how to simplify this equation correctly: $3(4+x)-2=$ 1m

19. Expand and simplify the following:

$8w(2w-3) - 2w(5-w) + w(6w+7) =$ ×3m 2

END OF PAPER ☺

QUESTIONS Show all necessary working in the space provided Marks will be allocated for working out	MARKS
1. If 13% of students were absent on Monday, what percentage of students were present? 13 − 100 = 87 ∴ it is 87%	1m
2. Express 24% as a fraction in simplest form 24% = $\frac{24}{100} = \frac{12}{50} = \frac{6}{25}$	2m
3. Shade 10% of this chocolate bar $20 \times \frac{10}{100} = 2$ 	1m
4. The table below gives the favourite hobbies of 80 Year 8 students: What percentage of students enjoy Touch Football as their favourite hobby? 40 + 20 + 16 + 4 = 80 $\frac{16}{80} \times 100 = 20\%$	2m
5. Express $\frac{1}{5}$ as a percentage $\frac{1}{5} \times 100 = 20\%$	1m

Favourite Hobby	Dancing	Netball	Touch Football	Swimming
Number of Students	40	20	16	4

6. Complete the sentences below by choosing the correct words: *Commission, ~~like,~~ unlike, ~~discount,~~ ~~out of one hundred,~~ coefficient* • The term PERCENT means out of one hundred • In algebra, only like terms can be added or subtracted • A discount is a reduction in the price of an item. • $3x$ and $5xy$ are examples of unlike terms.	4m
7. Find 12% of $950 $950 \times \frac{12}{100} = \$114$	1m
8. Circle the like terms below: (5ab) 4b −2a (10ba)	1m
9. Simplify $6p + 3p - 7p =$ $6p + 3p = 9p$ $9p - 7p = 3p$	1m
10. Explain why $2^3 = 8$ 2^3 equals 8 because it is $2 \times 2 \times 2$. $2 \times 2 = 4$ then $4 \times 2 = 8$. Therefore $2 \times 2 \times 2 = 8$	1m
11. Simplify $p^9 \div p^5 =$ $p^9 \div p^5 = 9-5$ $= p^4$	2m

12. Expand: $2(3f-4)$

$= 2 \times 3f - 2 \times 4$

$= 6f - 8$

1m

13. Fill in the missing terms:

a) $8pq \times$ [$7pr$] $= 56p^2qr$

1m

b) $3gh + 9g =$ [$3g$] $(h+3)$ ∴ $3g \times h + 3g \times 3 = 3gh + 9g$

1m

14. a) Find the HCF of $3bm$ and $12am$

3m

1m

b) Factorise: $3bm + 12am =$

$3m(b + 4a)$ – Answer

∴ $3m \times b + 4a \times 3m = 3bm + 12am$

1m

c) Factorise: $30b^2 - 35b$

$5b(6b - 7)$ – answer

∴ $5b \times 6b - 5b \times 7 = 30b^2 - 35b$.

1m

15. Simplify fully:

a) $\frac{3a}{4f} \times \frac{2f}{6a} = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

2m

b) $\frac{2m}{3} - \frac{4m}{15} =$

$= \frac{2m \times 15}{3 \times 15} - \frac{4m \times 3}{15 \times 3} = \frac{30m}{45} - \frac{12m}{45} = \frac{18m}{45} = \frac{2m}{5}$

2m

c) $\frac{n}{7} \div \frac{n}{3} = \frac{n}{7} \times \frac{3}{n} = \frac{3}{7}$

2m

16. Circle the correct answer for $(2x)^3 =$

A $2x^3$ B $6x^3$ C $8x^3$ D $9x^3$

1m

17. Darla works for a cosmetics company. She is paid a monthly retainer of $1500 plus a 3% commission on the value of the products she sells. This month Darla sold cosmetic products worth $16 000.

a) Calculate Darla's commission this month

$16000 \times \frac{3}{100} = \$480$. ∴ she gets $480 commission.

2m

b) Find Darla's total earnings this month.

commision = $48
retainer of $1500
she makes $1980.

1500 + 480 = 1980

1m

18. Jessica bought a pair of Roxy jeans for $90 to sell in her surf shop. The jeans didn't sell by the end of the season. In the winter sale they sold for $36.

a) Find Jane's loss.

$90 - 36 = 54$. $\frac{54}{90} \times 100 = 60\%$ she lost $54 or 60%

1m

b) Calculate the loss as a percentage of the cost price. 1m

$\frac{54}{90} \times 100 = 60\%$ loss ✓

18. In a school Maths exam, Michelle had to simplify : $3(4+x)-2=$ does not multiply

Michelle's working for this question is:

e.g $3 \times 4 + 3x \times -2$
$= 12 + 3x - 2$
$= 10 + 3x$

$3(4+x)-2 = 12+3x-6$
$= 18-3x$ correct working out.

a) Explain why Michelle's answer is incorrect. (use examples from her working) 1m

This is because she multiplied the -2 by 3 when she should of just multiplied the 4 and the x by 3 and then minus the answer by 2.

b) Show Michelle how to simplify this equation correctly: $3(4+x)-2=$ 1m

$= 3 \times 4 + 3 \times x - 2$
$= 12 + 3x - 2$
$= 10 + 3x$

19. Expand and simplify the following:

$8w(2w-3) - 2w(5-w) + w(6w+7) =$
$16w^2 - 24w - 10w + 2w^2 + 6w^2 + 7w$

$= 8w \times 2w - 8w \times 3 - 2w \times 5 - 2w \times w + w \times 6w + 7 \times w$ 3m
$= 16w^2 - 24w - 10w + 2w^2 + 6w^2 + 7w$ ✓
$= 16w^2 + 2w^2 + 6w^2 = 24w^2$
$= 24w - 10w + 7w = 21w$

$= 24w^2 + 21w$ 2

END OF PAPER ☺

more working out on

$8w \times 2w - 8w \times 3 - 2w \times 5 - w \times 2w + w \times 6w + 7 \times w$

$= 16w^2 - 24w - 10w - 2w^2 + 6w^2 + 7w$
$= 16w^2 + 2w^2 + 6w^2 = 24w^2$
$= 24w - 10w + 7w = 21w$
$= 21w + 24w^2$