

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
PAS4.3

Percentage operations
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		MARKS										
Show all necessary working in the space provided. Marks will be allocated for working out.												
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:	<table border="1"> <thead> <tr> <th>Favourite Hobby</th> <th>Dancing</th> <th>Netball</th> <th>Touch Football</th> <th>Swimming</th> </tr> </thead> <tbody> <tr> <td>Number of Students</td> <td>40</td> <td>20</td> <td>16</td> <td>4</td> </tr> </tbody> </table>	Favourite Hobby	Dancing	Netball	Touch Football	Swimming	Number of Students	40	20	16	4	2m
Favourite Hobby	Dancing	Netball	Touch Football	Swimming								
Number of Students	40	20	16	4								
5. Express $\frac{1}{5}$ as a percentage		1m										

<p>6. Complete the sentences below by choosing the correct words: <i>Commission, like, unlike, discount, out of one hundred, coefficient</i></p> <ul style="list-style-type: none"> 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
<p>7. Find 12% of \$950</p> <p>_____</p> <p>_____</p>	1m
<p>8. Circle the like terms below:</p> <p style="text-align: center;">$5ab$ $4b$ $-2a$ $10ba$</p>	1m
<p>9. Simplify $6p+3p-7p=$</p> <p>_____</p> <p>_____</p>	1m
<p>10. Explain why $2^3 = 8$</p> <p>_____</p> <p>_____</p>	1m
<p>11. Simplify $p^9 + p^5 =$</p> <p>_____</p> <p>_____</p>	2m

<p>12. Expand: $2(3f - 4)$</p> <p>_____</p> <p>_____</p>	1m
<p>13. Fill in the missing terms:</p> <p>a) $8pq \times \square = 56p^2qr$</p> <p>b) $3gh + 9g = \square (h + 3)$</p>	1m 1m
<p>14. a) Find the HCF of $3bm$ and $12am$</p> <p>_____</p> <p>b) Factorise: $3bm + 12am =$</p> <p>_____</p> <p>_____</p> <p>c) Factorise: $30b^2 - 35b$</p> <p>_____</p> <p>_____</p>	1m 1m 1m
<p>15. Simplify fully:</p> <p>a) $\frac{3x}{4x} \times \frac{2x}{6x} =$ _____</p> <p>_____</p> <p>_____</p>	2m

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

2m

c) $\frac{n}{7} + \frac{n}{3} =$

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

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

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

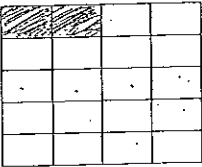
$13 - 100 = 87 \therefore$ it is 87%

2. Express 24% as a fraction in simplest form 2m

$24\% = \frac{24}{100} = \frac{12}{50} = \frac{6}{25}$

3. Shade 10% of this chocolate bar 1m

$20 \times \frac{10}{100} = 2$



4. The table below gives the favourite hobbies of 80 Year 8 students: 2m

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

What percentage of students enjoy Touch Football as their favourite hobby?

$40 + 20 + 16 + 4 = 80$ $\frac{16}{80} \times 100 = 20\%$

5. Express $\frac{1}{5}$ as a percentage 1m

$\frac{1}{5} \times 100 = 20\%$

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 4m
- A discount is a reduction in the price of an item.
- $3x$ and $5xy$ are examples of unlike terms.

7. Find 12% of \$950 1m

$950 \times \frac{12}{100} = \114

8. Circle the like terms below: 1m

(5ab) 4b -2a (10ba)

9. Simplify $6p + 3p - 7p =$ 1m

$6p + 3p = 9p$
 $9p - 7p = 2p$

10. Explain why $2^3 = 8$ 1m

it is 2^3 equals 8 because $2 \times 2 \times 2$.
 $2 \times 2 = 4$ then $4 \times 2 = 8$. Therefore $2 \times 2 \times 2 = 8$

11. Simplify $p^9 \div p^5 =$ 2m

$p^9 \div p^5 = \frac{9-5}{p^4}$
 $= p^4$

<p>12. Expand: $2(3f - 4)$</p> $= 2 \times 3f - 2 \times 4$ $= 6f - 8$	<p>1m</p>
<p>13. Fill in the missing terms:</p> <p>a) $8pq \times \boxed{7pr} = 56p^2qr$</p> <p>b) $3gh + 9g = \boxed{3g} \cdot (h + 3) \therefore 3g \times h + 3g \times 3$ $3 + 9 = 12$ $= 3gh + 9g$</p>	<p>1m</p> <p>1m</p>
<p>14. a) Find the HCF of $3bm$ and $12am$</p> <p style="text-align: center;">$3m$</p> <p>b) Factorise: $3bm + 12am =$ $\boxed{3m(b + 4a)}$ - Answer $\therefore 3m \times b + 4a \times 3m = 3bm + 12am$</p> <p>c) Factorise: $30b^2 - 35b$ $\boxed{5b(6b - 7)}$ - answer $\therefore 5b \times 6b - 5b \times 7 = 30b^2 - 35b$</p>	<p>1m</p> <p>1m</p> <p>1m</p>
<p>15. Simplify fully:</p> <p>a) $\frac{3x}{4x} \times \frac{2x}{6x} = \frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$</p>	<p>2m</p>

<p>b) $\frac{2m^3 \cdot 4m}{3x^5 \cdot 15} = \frac{8m^4}{45}$</p> <p>c) $\frac{n}{7} \div \frac{n}{3} = \frac{n}{7} \times \frac{3}{n} = \frac{3}{7}$</p>	<p>2m</p> <p>2m</p>
<p>16. Circle the correct answer for $(2x)^3 =$</p> <p>A $2x^3$ B $6x^3$ C $\boxed{8x^3}$ D $9x^3$</p>	<p>1m</p>
<p>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.</p> <p>a) Calculate Darla's commission this month</p> <p>$16000 \times \frac{3}{100} = \\480. \therefore she gets \$480 commission.</p> <p>b) Find Darla's total earnings this month.</p> <p>commission = \$480 retainer of \$1500 she makes \$1980.</p>	<p>2m</p> <p>1m</p>
<p>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.</p> <p>a) Find Jane's loss.</p> <p>$90 - 36 = 54$. $\frac{54}{90} \times 100 = 60\%$ she lost $\frac{54}{90}$</p>	<p>1m</p>

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

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

1m

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. $3 \times 4 + 3 \times x - 2 = 12 + 3x - 2 = 10 + 3x$ correct working out.

$$3(4+x)-2 = 12+3x-6 = 10+3x$$

$$= 18-3x$$

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

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.

1m

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

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

$$= 12 + 3x - 2$$

$$= 10 + 3x$$

1m

19. Expand and simplify the following:

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

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

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

$$= 16w^2 + 2w^2 + 6w^2 - 24w - 10w + 7w = 24w^2 - 27w$$

2

$$= 24w^2 + 21w$$

END OF PAPER ☺

more working out on

5

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

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

$$= 16w^2 - 2w^2 + 6w^2 - 24w - 10w + 7w = 24w^2 - 27w$$

$$= 24w^2 - 27w$$

$$= 21w + 24w^2$$