

Y8 Maths

Unit 6 Test

Fractions, Decimals
and Percentages

Name: MARK SCHEME
(OUT of 45)

CALCULATOR

1. a) Which of these fractions will give recurring decimals?

$$\frac{n}{5}, \frac{n}{3}, \frac{n}{11}, \frac{n}{10}, \frac{n}{25}, \frac{n}{6}$$

(-1 each error or omission) B 2, 1, 0

$$\frac{n}{3} \quad \frac{n}{11} \quad \frac{n}{6}$$

- b) Complete the gaps in this table

$\frac{1}{3}$	$\frac{6}{10}$ o.e.	$\frac{1}{9}$	$\frac{1}{2}$
0.3	0.6	0.1	0.5

B, each correct entry

(6 marks)

2. Write these recurring decimals as fractions.

a) $0.\dot{2}7$

$$\begin{aligned} x &= 0.272727 \dots \\ 100x &= 27.272727 \dots \end{aligned} \quad \left. \begin{array}{l} \\ \end{array} \right\} M_1 \text{ for multiplying by } 10 \text{ or } 100 \text{ or } 1000 \dots$$

$$\Rightarrow 99x = 27$$

$$x = \frac{27}{99} \left(= \frac{3}{11} \right) A_1$$

$$\frac{27}{99} = \frac{3}{11}$$

(No need to cancel)

b) $0.\dot{1}8\dot{6}$

$$\begin{aligned} x &= 0.186186186 \dots \\ 1000x &= 186.186186186 \dots \end{aligned} \quad \left. \begin{array}{l} \\ \end{array} \right\} M_1$$

$$\Rightarrow 999x = 186$$

$$x = \frac{186}{999} \left(= \frac{62}{333} \right) A_1$$

$$\frac{186}{999} = \frac{62}{333}$$

(No need to cancel)

(4 marks)

10

3. Write these fractions as recurring decimals.

(you must show how you worked out your answers)

a) $\frac{5}{11}$

$11 \overline{) 5.0000} \quad 0.4545 \dots$

M₁ attempting to divide and showing at least 3 dp for quotient (condone one numerical slip)

$0.4\dot{5}$ *A₁*

b) $\frac{7}{12}$

$12 \overline{) 7.0000} \quad 0.5833 \dots$

M₁ attempting to divide

$0.58\dot{3}$ *A₁*

(4 marks)

4. Form 8B were investigating how a metal bar expands while being heated. The bar was originally 30cm in length and it expanded to 31.75cm.

Calculate the percentage increase in length. Give your answer correct to 1 decimal place.

Increase = 31.75 - 30 = 1.75cm *B₁*

$\% \text{ Increase} = \frac{1.75}{30} \times 100$ *M₁ (use of original length with their Increase)*

$= 5.8$

5.8% *A₁*

(3 marks)

5. Mr Bell bought a freezer in a sale where all goods were 20% off. He saved £49. What was the original price of the freezer?

$20\% = \pounds 49$

$\Rightarrow 10\% = \pounds 24.50$

$\Rightarrow 100\% = \pounds 245$ *A₁*

M₁ for linking 20% with £49

$\pounds 245$

(2 marks)

6. A bicycle wheel's circumference is 81.6cm (to 3 significant figures). Paul estimated the circumference to be 72cm.

Use the following formula to find Paul's percentage error.

$$\text{Percentage error} = \frac{\text{actual error}}{\text{correct length}} \times 100\%$$

$$\text{ACTUAL ERROR} = 81.6 - 72 = 9.6 \quad B_1$$

$$\% \text{ Error} = \frac{9.6}{81.6} \times 100 = 11.8$$

M_1 (correct substitution into formula)

$$A_1 \quad 11.8\%$$

(3 marks)

7. a) Increase £840 by 12%

$$840 \times 1.12 = \pounds 940.80 \quad M_1$$

$$A_1 \quad \pounds 940.80$$

Accept
Alternative
Correct
Methods

- b) Decrease £645 by 14%

$$645 \times 0.86 = \pounds 554.70 \quad M_1$$

$$A_1 \quad \pounds 554.70$$

- c) Increase £450 by $7\frac{1}{2}\%$

$$450 \times 1.075 = \pounds 483.75 \quad M_1$$

$$A_1 \quad \pounds 483.75$$

(6 marks)

8. Andy bought a car for Dh75,000 and sold it for Dh25,000. What is Andy's percentage loss?

$$\text{ACTUAL LOSS} = 75000 - 25000 = 50000 \quad B_1$$

$$\% \text{ Loss} = \frac{50000}{75000} \times 100 \quad M_1$$

$$= 66.7\% \quad A_1$$

$$66.7\%$$

(3 marks)

9. In a '15%' off sale, Freya bought a DVD player for £179.99. What was the original price of this DVD player?

Method 2

Method 1

$$\text{Original Price} \times 0.85 = \text{£}179.99 \quad (M_1) \quad 85\% = \text{£}179.99$$

$$\begin{aligned} \text{Original Price} &= \frac{179.99}{0.85} \quad (M_1) \quad 1\% = \frac{179.99}{85} (= 2.117529...) \\ &= \text{£}211.75 \quad (A_1) \end{aligned}$$

an interim % quantity which could lead them to find 100%.

must be rounded to 2 dp

(3 marks)

10. The number of dragonflies around a lake is expected to decrease by 8% per year. At the end of 2010 there were 145 dragonflies.

- a) How many dragonflies were there predicted to be at the end of 2011?

$$145 \times 0.92 = 133.4 \quad (M_1)$$

133
 (A1)

- b) How many dragonflies were there predicted to be at the end of 2014?

$$145 \times (0.92)^4 = 103.9 \quad (M_1) \quad \text{A1 can be implied by final ans of 103 or 104}$$

(students may calculate need upto 2014 for M1)

103 (not 104)
 (A1)

- c) At the end of which year will the number of dragonflies fall below 80?

$$145 \times (0.92)^n < 80 \quad (M_1)$$

$$(0.92)^n < \frac{80}{145}$$

2018
 (A1)

(8 marks)

M1 - use a method of trial and improvement to find $n = 8$

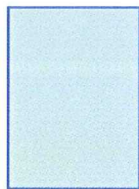
* In part c students may calculate the totals at the end of each year. They are: 2015 - 95 2016 - 87 2017 - 80 and 2018 - 74
 (A1)

*

11

11. The perimeter of a large square is 20% greater than the perimeter of a smaller square.

Work out the length of one side of the smaller square if the perimeter of the large square is 36 cm.



$$\text{Small perimeter} \times 1.2 = 36$$

$$\text{Small perimeter} = \frac{36}{1.2} \quad M_1$$
$$= 30$$

$$\therefore \text{one side of smaller square} = 30 \div 4 = 7.5 \quad M_1$$

A₁

7.5 cm.

(3 marks)

END of Test

Challenge

If you have finished and checked your work, try this challenge.

You will not be marked on this section.

A 10 volt battery loses 1% of its capacity every time it is recharged. How many times can it be recharged before its capacity falls to below 1 volt?

$$10 \times (0.99)^n < 1$$

$$(0.99)^n < \frac{1}{10}$$

$n = 230$ using a method of
trial and improvement.

