Y7 Maths

Unit 3 Test

Equations, Functions & Formulae

Name: MARK SCHEME

MARKS

1 Use the formula $y = mx + c$ to work out the value of y

2 **a** when $m = 8$, $x = 3$, $c = 4$

$y = 8 \times 3 + 4$ M1

$= 24 + 4$

$y = 28$ A1

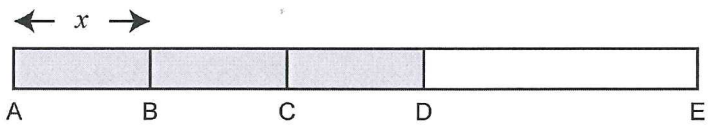
2 **b** when $m = -2$, $x = -5$, $c = -5$

$y = -2 \times -5 + (-5)$ M1

$= 10 - 5$

$y = 5$ A1

2 **2**



The diagram shows a strip of wood ABCDE.

AB = BC = CD = x cm

DE is twice the length of CD.

Express the total length, AE, in terms of x. Give your answer in its simplest form.

$x + x + x + 2x$ M1

$5x$ A1 ..... cm

1 **3** Bill is h cm tall. Sienna is 4 cm taller than Bill.

Write down an expression in terms of h for Sienna's height in centimetres.

$h + 4$ B1 ..... cm

4 A bag of sugar has a mass of 2 kg.

1 **a** Write down an expression in terms of n for the total mass in kilograms of n bags of sugar.

$2n$ B1 ..... kg

2 **b** Write down an expression in terms of n for the total mass in grams of n bags of sugar.

$2n \times 1000$

M1 for ×1000 seen or implied by 2000

$2000n$ A1 ..... g

Marks

5 Annie uses this formula to work out her total pay, £T, each week.

$$T = RH$$

£R is her pay for one hour's work. H is the number of hours she works.

Find T

2 **a** when $R = 10$ and $H = 40$ $T = 10 \times 40$ M1

£ 400 A1

2 **b** when $R = 15$ and $H = 7$ $T = 15 \times 7$ M1

£ 105 A1

2 **6** Pens cost x pence each. Rulers cost y pence each.

Hassan buys 3 pens and 2 rulers.

Write an expression for the total amount, in pence, which Hassan spends.

B1 B1 $3x + 2y$

7 Simplify, by collecting like terms.

1 **a** $4x + 5x - x$

$8x$ B1

1 **b** $-2p + 5p - p$

$2p$ B1

2 **8** $A = 2x^2$

Work out the value of A when $x = 4$ $A = 2(4)^2$ M1

$= 2 \times 16$

$A = 32$ A1

9 Simplify, by collecting like terms.

2 **a** $4x + 5y - x - 3y$

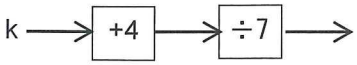
B1 B1 $3x + 2y$

2 **b** $-2p + 5q - p + q$

B1 B1 $-3p + 6q$

10 Write an expression for the output of this function machine:

1



$(k+4) \div 7$ OR $\frac{k+4}{7}$ B1

11 Expand

2 **a** $4(x + 3)$

B1 B1

$4x + 12$

2 **b** $x(x + 3)$

B1 B1

$x^2 + 3x$

2 **12** Simplify by collecting like terms $r^2 + 5r + 3r^2 - 2r$

B1 B1

$4r^2 + 3r$

13 The formula for converting between Fahrenheit (F) and Celsius (C) is:

3 $C = \frac{5(F-32)}{9}$

Convert 50°F into Celsius

$C = \frac{5(50-32)}{9}$ M1

$= \frac{5 \times 18}{9}$

$= \frac{90}{9}$ (or 5×2) M1

A1

$10°C$

14 The cooking time for a joint of meat is 40 minutes per kg plus an extra 15 minutes.

3 Write down a formula that connects the cooking time in minutes, ***C***, to the mass in kg, ***m***.

B1 B1 B1

$C = 40m + 15$

15 Write the expanded, longer version of:

1 **a** y^4

B1

$y \times y \times y \times y$

1 **b** $4y$

B1

$y + y + y + y$

2 **16 a** Expand $3k(2k + 4)$

B1 B1

$6k^2 + 12k$

3 **b** Find the value of $3k(2k + 4)$ when $k = 2$

$= 3 \times 2 (2 \times 2 + 4)$ M1

$= 6 (4 + 4)$

$= 6 \times 8$ M1

48 A1

17 Factorise fully

2 **a** $5x + 20$

B1 for 5(2 terms)

B2 cao $5(x + 4)$

2 **b** $16x - 20 + 32y$

B1 for 4(3 terms)

B2 cao $4(4x - 5 + 8y)$

TOTAL = 48

[End of Test]