Name _____ Date _____

"Y8"- End of units 1 & 2 test

1 Write down the numbers in this list that are irrational.

$$-2.7 \quad \sqrt{27} \quad \frac{2}{7} \quad \sqrt[3]{27} \quad \sqrt{2}\times 7$$

_____ **[2]**

2 a Show that $\sqrt{5}\times\sqrt{20}$ is an integer.

_____ **[1]**

b Write down two irrational numbers with a sum of 4.

_____ **[1]**

3 Write each of these numbers without using indices.

a 4^0 _____

b 4^4 _____

c 4^{-2} _____ **[3]**

4 Find an irrational number that is between

a 1 and 2 _____

b 9 and 10. _____ **[2]**

5 Write these numbers in standard form.

a 6 320 000 _____

b 0.000 012 9 _____ **[2]**

6 Here are three numbers:

$$x = 3.5 \times 10^5 \qquad y = 8.4 \times 10^4 \qquad z = 2.989 \times 10^5$$

a Write down number x in full.

_____ **[1]**

b List the three numbers in order of size, smallest first.

_____ **[1]**

7 a Here is a statement: $17 < \sqrt{300} < 18$

Is the statement true or false? Give a reason for your answer.

_____ **[1]**

b Here is a statement: $7 < \sqrt[3]{300} < 8$

Is the statement true or false? Give a reason for your answer.

_____ **[1]**

8 Write each number as a power of 2.

a 32 _____

b 1 _____

c $\dfrac{1}{8}$ _____ **[3]**

9 a Write $5^3 \times 5^4$ as a power of 5.

_____ **[1]**

b Write $6^3 \div 6^5$ as a power of 6.

_____ **[1]**

10 Work out the value of these expressions.

   a $4a - 7b$ when $a = 6$ and $b = -3$ _____

   _____ **[2]**

   b $2x^2 + 4y^3$ when $x = 4$ and $y = -2$ _____

   _____ **[2]**

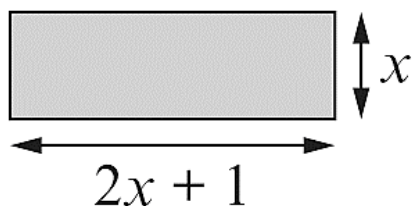   **c** $h\left(9 - \dfrac{12}{g}\right)$ when $g = -4$ and $h = 6$ _____

   _____ **[2]**

11 The diagram shows a rectangle.

   Write an expression, in its simplest form, for:

   a the perimeter of the rectangle _____ **[2]**

   b the area of the rectangle. _____ **[2]**

12 Simplify each expression.

   a $p^7 \times p^5 =$ _____   **b** $q^8 \div q^2 =$ _____

   c $\left(r^3\right)^5 =$ _____   **d** $4t^5 + 2t^5 =$ _____ **[4]**

13 Circle the correct answer, A, B, C or D.

   a Simplify $4x^3 \times 3x^2$ **A** $12x^6$ **B** $12x^5$ **C** $7x^6$ **D** $7x^5$

   b Simplify $5y \times 2y^5$ **A** $7y^6$ **B** $7y^5$ **C** $10y^6$ **D** $10y^5$

   c Simplify $\dfrac{2k^{10}}{4k^2}$ **A** $\dfrac{1}{2}k^8$ **B** $\dfrac{1}{2}k^5$ **C** $2k^8$ **D** $2k^5$

d Simplify $\dfrac{10m^8}{15m}$ **A** $1\dfrac{1}{2}m^7$ **B** $\dfrac{2}{3}^8$ **C** $\dfrac{2}{3}m^7$ **D** $\dfrac{3}{2}m$

e Simplify $\dfrac{12n^2}{8n^6}$ **A** $1\dfrac{1}{2}n^4$ **B** $\dfrac{2}{3}n^{-3}$ **C** $\dfrac{2}{3n^4}$ **D** $\dfrac{3}{2}n^{-4}$ **[5]**

14 Expand and simplify these expressions.

a $(y+3)(y+5)$ _____

b $(m+1)(m-2)$ _____

c $(p-5)(p-3)$ _____

d $(n-8)^2$ _____

e $(x+2)(x-2)$ _____ **[5]**

15 Simplify these expressions.

a $\dfrac{x}{5}+\dfrac{2x}{5}$ _____

b $\dfrac{y}{2}-\dfrac{y}{3}$ _____

c $\dfrac{a}{4}+\dfrac{b}{8}$ _____

d $\dfrac{2a}{9}+\dfrac{b}{6}$ _____

e $\dfrac{15x+45}{5}$ _____ **[5]**

16 a Use the formula $T=px$ to work out the value of T when $p=15$ and $x=2$.

_____ **[2]**

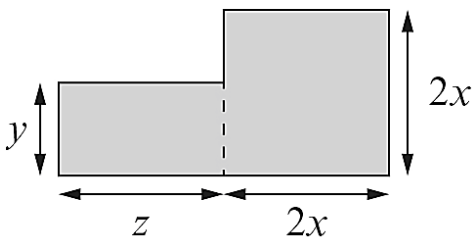**b i** Rearrange the formula $T=px$ to make p the subject. _____ **[1]**

   ii Work out the value of p when $T=42$ and $x=7$.

_____ **[2]**

17 Make x the subject of each of these formulae. Circle the correct answer, A, B or C.

a $\quad y = 3x + c$ $\qquad$ **A** $\quad x = \dfrac{y+c}{3}$ $\qquad$ **B** $\quad x = \dfrac{y-c}{3}$ $\qquad$ **C** $\quad x = \dfrac{y}{3} - c$

b $\quad y = \dfrac{x}{4} - 2k$ $\qquad$ **A** $\quad x = \dfrac{y+2k}{4}$ $\qquad$ **B** $\quad x = 4(y - 2k)$ $\qquad$ **C** $\quad x = 4(y + 2k)$

c $\quad y = \dfrac{x+b}{4a}$ $\qquad$ **A** $\quad x = 4ay - b$ $\qquad$ **B** $\quad x = 4a(y - b)$ $\qquad$ **C** $\quad x = 4ay + b$ $\qquad$ **[3]**

18 This diagram shows a shape made from a square and a rectangle.

a Write down a formula for the area (A) of the shape.

_____ **[2]**

b Work out A when $x = 3$, $y = 4$ and $z = 7$.

_____ **[2]**

c Rearrange your formula to make x the subject.

_____

_____ **[2]**

d Work out x when $A = 79$, $y = 3$ and $z = 5$.

_____ **[2]**

[Total: 65 marks]

END OF TEST