ALGEBRA – practice Maths diagnostic test

(Non-calculator paper)

1. Solve the equation:

   a) $3x + 2 = 16$ (1)

   b) $5(2x - 1) = 35$ (1)

   c) $\dfrac{x}{3} = -4$ (1)

   d) $4x + 3 = 18 - 2x$ (1)

2. Simplify $2c + 6d + 4c - 8c$ (1)

3. Multiply out:

   a) $4(m - 1)$ (1)

   b) $p(p + 3)$ (1)

4. Expand the brackets and simplify:

   a) $2(3x + 1) - 3(x - 2) =$ (2)

   b) $x(2x - 3) + 4(x^2 + 1) =$ (2)

5. Factorise:

   a) $4c + 12$ (1)

   b) $x^2 + 5x$ (1)

   c) $x^2 - 10x + 25$ (2)

d) $x^2 - 16$ (2)

6. Factorise completely $8x^3y^2 - 4xy^3$ (2)
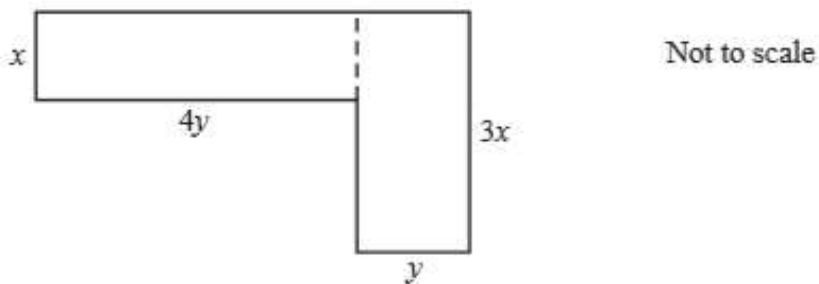
7. Multiply and simplify $(n+3)^2$ (2)

8. Simplify:
a) $n^6 \times n^5$ (1)

b) $\dfrac{x^2+5x+6}{(x+3)^2}$ (3)

9.

This shape is made up of rectangles.

Not to scale

(a) Write down an expression, in terms of x and y, for the **perimeter** of the shape.

....

....

....

Answer ....

(2)

(b) If $x = 2$ cm and $y = 5$ cm, find the **area** of the shape.

....

....

....
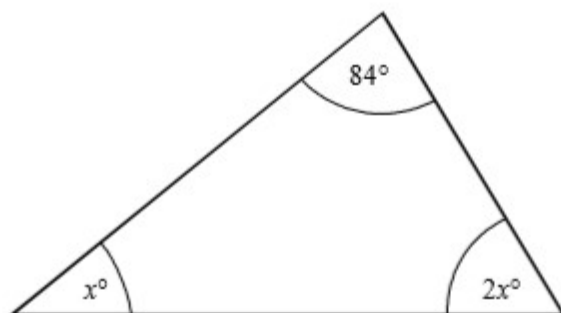
Answer .... cm^2

(2)

10.

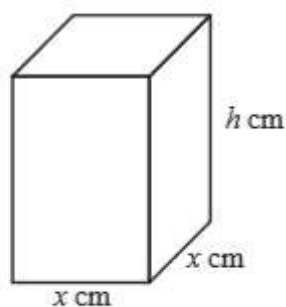The triangle has angles $x°$, $2x°$ and $84°$ as shown.
Find the value of x.

Not drawn
accurately

(3)

11.

A cuboid has a square base of side x cm.
The volume of the cuboid is V cm^3 and the height is h cm.

h cm

x cm

x cm

(a)   Write down an expression for x in terms of V and h.

Answer $x =$ ....

(3)

(b)   Find the value of x when $V = 150$ and $h = 24$.

Answer ....

(1)

Total (4)

12. Make p the subject of the formula $y = 3p^2 - 4$ (3)

13. a) Solve $6x + 4 > x + 17$ (2)

b) n is an integer with $-5 < 2n \leq 6$. Write down all the values on n. (2)

14. Solve $x^2 - 4x + 3 = 0$ (2)

15. Simplify fully: (3)

a) $\dfrac{3-x}{3x^2 - 5x - 12}$

b) Write $\dfrac{x}{x-1} - \dfrac{x}{x+1}$ as a single fraction in its simplest form (4)

End of Paper