Test 8

There are **7 questions** in this test. Give yourself **10 minutes** to answer them all.
You may use a calculator for this test.

1. Which of these is **not** an equation? Circle your answer.

$x^2 - 1 = 0$ $\quad 3x = x + 2$ $\quad \pi r^2$ $\quad x = y$

[1]

2. The values m and n satisfy the equation $2m + 3n = 13$.
Circle the equation below that must be satisfied by the same values of m and n.

$3m + 2n = 13$ $\quad 4m + 6n = 26$ $\quad m + 2n = 12$ $\quad m + 4n = 13$

[1]

3. Solve the inequality $-2x > 100$.

.....
[1]

4. A quadratic equation factorises to $(x - 2)(x + 1) = 0$. What are the possible values of x?

$x =$ .....

$x =$ .....
[1]

5. Fully factorise $32a^2b^3 - 4a^3$.

.....
[2]

6. Solve these simultaneous equations:

$4x + 2y = -6$
$x + 5y = 12$

$x =$ .....

$y =$ .....
[3]

7. A *geometric progression* is a sequence where each term is obtained by multiplying the previous term by a constant number, called the *common ratio*.

The first term of a geometric progression is 3 and the fourth term is 24. Work out the common ratio of this sequence and then use it to find the second and third terms.

Common ratio: .....

Second term: ..... Third term: .....
[3]

/ **12**

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1. πr^2 ***[1 mark]*** *An equation has to contain an equals sign.*

2. $4m + 6n = 26$ ***[1 mark]***

3. $-2x > 100 \Rightarrow x < 100 \div -2$
   $\Rightarrow x < -50$ ***[1 mark]***
   Don't forget to flip the inequality sign around when dividing by a negative.

4. Either $x - 2 = 0$ or $x + 1 = 0$, so $x = 2$ or $x = -1$ ***[1 mark]***.

5. $32a^2b^3 - 4a^3 = 4(8a^2b^3 - a^3)$
   $= 4a^2(8b^3 - a)$
   [2 marks for the fully factorised expression, otherwise 1 mark for a partially factorised expression]

6. $x + 5y = 12 \xrightarrow{\times 4} 4x + 20y = 48$
   $4x + 20y = 48$
   $-\ 4x + 2y = -6$
   $18y = 54$
   $y = 3$
   $x + 5y = 12$
   $\Rightarrow x = 12 - (5 \times 3) = -3$
   [1 mark for scaling one of the equations, 1 mark for x, 1 mark for y]

7. First term 3 and fourth term 24, so $24 = 3 \times r \times r \times r$, where r is the common ratio ***[1 mark]***.
   $\Rightarrow 24 = 3r^3 \Rightarrow r^3 = 8$
   $\Rightarrow r = \sqrt[3]{8} = 2$ ***[1 mark]***
   The second term is $3 \times 2 = 6$ and the third term is $6 \times 2 = 12$ ***[1 mark]***.