Year 12 AS/A level Maths

Overview task

Instructions

- The time for the test is 1 hour.
- Answer **all** questions on lined paper **(NOT ON THE QUESTION PAPER)**

Information

- The total mark for this paper is 48.
- The marks for each question are shown in brackets
  -use this as a guide as to how much time to spend on each question.

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

YEAR 12 Overview Task –. WRITE YOUR SOLUTIONS ON A SEPARATE PIECE OF PAPER **NOT ON THE QUESTION PAPER**

1 Simplify these expressions.

a $\dfrac{x^6 \times x^2}{x^5}$ **(1 mark)**

b $(3x^4)^2$ **(1 mark)**

c $\dfrac{4x^{\frac{1}{3}}}{(16x^{-3})^{\frac{3}{4}}}$ **(3 marks)**

2 Solve $2x^3 \times 3x^2 = 6144$ **(2 marks)**

3 Find the value of x.

$x^{-\frac{2}{3}} = \dfrac{1}{25}$ **(2 marks)**

4 **a** Write $\sqrt{448}$ in the form $a\sqrt{7}$, where a is an integer. **(1 mark)**

b Expand and simplify $(3-\sqrt{5})(2+3\sqrt{5})$. **(2 marks)**

c Simplify $\dfrac{4-2\sqrt{3}}{5+\sqrt{3}}$ giving your answer in the form $a+b\sqrt{c}$, where a, b and c are rational numbers. **(3 marks)**

5 The area of a triangle is given as $(16+4\sqrt{5})$ cm^2.

The base of the triangle is $(7-\sqrt{5})$ cm, and the perpendicular height is $(p+q\sqrt{5})$ cm.

Find the values of p and q. **(4 marks)**

6 Expand and simplify these expressions.

a $4(2x+3y)$ **(1 mark)**

b $(3x-1)(4x+3)$ **(2 marks)**

c $(x+1)^2(x-3)$ **(3 marks)**

7 Fully factorise these expressions.

a $3x-12xy$ **(1 mark)**

b x^2-5x+6 **(1 mark)**

8 Solve these equations.

a $2x+15=7$ **(1 mark)**

b $x^2-11x+10=0$ **(2 marks)**

c $3x^2-7x+3=0$ **(2 marks)**

9 Solve these pairs of simultaneous equations.

a $3x+y=2$ **(3 marks)**
$4x-y=-9$

b $y=4x+3$ **(3 marks)**
$2y=2x+3$

c $x-y=1$ **(4 marks)**
$x^2+y^2=13$

10 Solve these inequalities.

a $3x+5\leqslant 12$ **(1 mark)**

b $4x-3>9x-7$ **(2 marks)**

c $x^2+x-56\leqslant 0$ **(2 marks)**

11 The function f is defined as $f(x)=x^2-7$

Find the value of $f(-3)$. **(1 mark)**

This is the end of the test.