

Test 2: Exponents and surds [51]

Question 1

1.1 Simplify each of the following

2.1.1 $\frac{(3x)^{-2}}{3x^{-3}}$ (3)

2.1.2 $\frac{x^{-1} + y^{-1}}{x^{-1}y - y^{-1}x}$ (5)

2.1.3 $\sqrt{108x^{12}} + \sqrt{243x^{12}}$ (3)

2.2 Solve for x : $2^{3x-6} = \sqrt{8}$ (3)

1.3 Solve for x if

1.3.1 $9^{x^2+x} = 27^{x+1}$ (5)

1.3.2 $2^{x+1} + 2^{x+2} = 48$ (5)

1.3.3 $3^{2x} - 3 \cdot 3^x = -2$ (5)

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Question 2

2.1 Simplify each of the following:

2.1.1 $\frac{x^{\frac{1}{3}} \cdot x^{\frac{1}{4}}}{x^{\frac{1}{6}}}$ (3)

2.1.2 $\sqrt{128x^6} + \sqrt{98x^6}$ (3)

2.1.3 Show that $\frac{\sqrt{x}}{x} + \frac{y}{\sqrt{x}}$ can be written as $\frac{\sqrt{x}(1+y)}{x}$ (4)

2.2 Simplify:

2.2.1 $\frac{3\sqrt{18}-\sqrt{50}}{2\sqrt{72}}$ (4)

2.2.2 $\frac{2\sqrt{18}-\sqrt{32}}{\sqrt{8}+\sqrt{2}}$ (4)

2.2.3 $\frac{\sqrt{75}-\sqrt{18}}{\sqrt{12}}$ (4)

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