

Attempt all questions.

Necessary working has to be shown.

Marks may be deducted for badly arranged work

Time: 55 minutes

Name:

Teacher /

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| <p>Q.1. Simplify the following. (3m)</p> <p>(i) $\sqrt{18}$ (ii) $\sqrt{72}$</p> <p>Q.2 If $3\sqrt{5} = \sqrt{x}$, find the value of x.</p> | <p>Q.4 Expand and simplify (8m)</p> <p>(i) $(2 + \sqrt{3})^2$</p> <p>(ii) $(2\sqrt{3} - 1)^2$</p> |
| <p>Q.3. Simplify the following. (3m)</p> <p>(i) $2\sqrt{50} + 3\sqrt{8} - \sqrt{2}$</p> <p>(ii) $2\sqrt{2} \times 6\sqrt{6}$</p> | <p>(iii) $(2 + \sqrt{3})(2\sqrt{3} - 1)$</p> <p>(iv) $(2\sqrt{3} - 1)(2\sqrt{3} + 1)$</p> |

Q.7. Factorise the following. (6m)

(i) $x^2 - 6x + 8$

(ii) $x(x - p) + y(x - p)$

(iii) $3a^2 + 5a - 2$

(iv) $a^3 - a^2 - a + 1$

Q. 8 Express as a single fraction with a rational denominator:

(Hint: Rationalise the denominator of each fraction first)

(3m)

$$\frac{1}{2 + \sqrt{5}} + \frac{3 + \sqrt{3}}{3 - \sqrt{3}}$$

Q.9. If $x = \sqrt{3} + 1$ find the value of $x^2 - \frac{1}{x^2}$

Q.5 Simplify

(6m)

(i) $\frac{3}{\sqrt{5}} + \frac{2}{\sqrt{10}}$

(ii) $\frac{1}{\sqrt{2}} + \frac{3}{2}$

(iii) $\frac{2\sqrt{50} \times 3\sqrt{8}}{2\sqrt{2}}$

Q.6 Rationalise the denominator of the following fractions. (5m)

(i) $\frac{1}{2\sqrt{5}}$

(ii) $\frac{1}{2+\sqrt{5}}$

(iii) $\frac{3+\sqrt{3}}{3-\sqrt{3}}$

ANSWERS TO ST. CATHERINE'S – YR 10 MAR 2004 SURDS TEST

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|------------|-----------------------|------------|-----------------------|------------|---------------------------|------------|-----------------------------------|-----------|--------------------------|------------|-------------------|
| 1 i | $3\sqrt{2}$ | ii | $6\sqrt{2}$ | 2 | $x = 45$ | 3 i | $15\sqrt{2}$ | ii | $24\sqrt{3}$ | 4 i | $7 + 4\sqrt{3}$ |
| ii | $13 - 4\sqrt{3}$ | iii | $3\sqrt{3} + 4$ | iv | 11 | 5 i | $\frac{3\sqrt{5} + \sqrt{10}}{5}$ | ii | $\frac{\sqrt{2} + 3}{2}$ | iii | $30\sqrt{2}$ |
| 6 i | $\frac{\sqrt{5}}{10}$ | ii | $\sqrt{5} - 2$ | iii | $2 + \sqrt{3}$ | 7 i | $(x - 2)(x - 4)$ | ii | $(x + y)(x - p)$ | iii | $(3a - 1)(a + 2)$ |
| iv | $(a + 1)(a - 1)^2$ | 8 i | $\sqrt{5} + \sqrt{3}$ | ii | $\frac{6 + 5\sqrt{3}}{2}$ | | | | | | |

28/3/06