Pure Mathematics   **Date:** ………………

Surds and Indices – GCSE Revision

Do not use a calculator for the questions on this sheet.

Exercise A

1. Simplify,

    $$6\sqrt{75}$$

2. Simplify,

    $$\sqrt{8} - 6\sqrt{18} + 3\sqrt{72} - 5\sqrt{50}$$

3. Express $3\sqrt{72}$ in the form, $k\sqrt{2}$, where k is an integer to be found.

4. Simplify and write the following in the form $a + b\sqrt{c}$ where a, b and c are integers to be found.

    $$\left(2\sqrt{3} - 5\right)\left(3\sqrt{3} - 2\right)$$

5. Rationalize the denominators:

    (a) $\dfrac{\sqrt{2}}{5\sqrt{3}}$ (b) $\dfrac{2}{5 + \sqrt{3}}$

    (c) $\dfrac{2\sqrt{5} - 3}{4\sqrt{5} - 3}$

6. Express $\dfrac{3 - 2\sqrt{3}}{1 + 3\sqrt{3}}$ in the form $a + b\sqrt{3}$ where a and b are constants to be found.

Exercise B

1. Find the value of:

    (a) 3^{-2} (b) $8^{\frac{1}{3}}$ (c) $16^{\frac{3}{4}}$

    (d) $36^{-\frac{1}{2}}$ (e) $8^{-\frac{4}{3}}$

2. Simplify:

    (a) $\left(\dfrac{2}{5}\right)^{-3}$ (b) $\left(\dfrac{4}{9}\right)^{\frac{1}{2}}$ (c) $\left(\dfrac{64}{125}\right)^{-\frac{2}{3}}$