Indices

<u>*Skill: Writing one number as the power of another*</u>

<u>Questions</u>

Attempt these questions independently showing full solutions. Check each answer as you go.

1. Write the following in the form 5^n where n is a constant to be determined.

   (a) 125 　　　　　　(b) $\frac{1}{25}$ 　　　　　　(c) $\sqrt{25}$

   (d) $\frac{1}{\sqrt[4]{125}}$ 　　　　　(e) $5^{-60} \times 25^{-200}$

2. Write the following in the form 3^n where n is a constant to be determined.

   (a) 81 　　　　　　(b) $\frac{1}{27}$ 　　　　　　(c) $\sqrt{27}$

   (d) $\frac{1}{\sqrt[5]{3}}$ 　　　　　(e) $3^{-7} \times 9^{-33} \times 27^{40}$

3. Write the following in the form 4^n where n is a constant to be determined.

   (a) 64 　　　　　　(b) $\frac{1}{16}$ 　　　　　　(c) 8

   (d) $\sqrt[3]{32}$ 　　　　　(e) $2^{180} \times 4^{-90}$

4. Write the following in the form 8^n where n is a constant to be determined.

   (a) 1 　　　　　　(b) $\frac{1}{64}$ 　　　　　　(c) 4

   (d) $\sqrt[3]{16}$ 　　　　　(e) $2^{-5} \times 4^{-6}$

5. Find the value of the unknown in each of the following examples. Answers that rely on calculator technology are not acceptable.

   (a) $3^{2x} = 27$ 　　　　(b) $25^x = 125$ 　　　　(c) $\left(\frac{1}{9}\right)^x = 3$

   (d) $\left(\sqrt{2}\right)^{3x} = \frac{1}{64}$ 　　　(e) $2^{2x-1} = 8^{x-2}$ 　　　(f) $4^{2t-1} = \left(\frac{1}{8}\right)^{1-t}$

   (f) $2^{x^2} = 4^{x+4}$ 　　　(g) $9^{x^2-1} = 27^{x-1}$