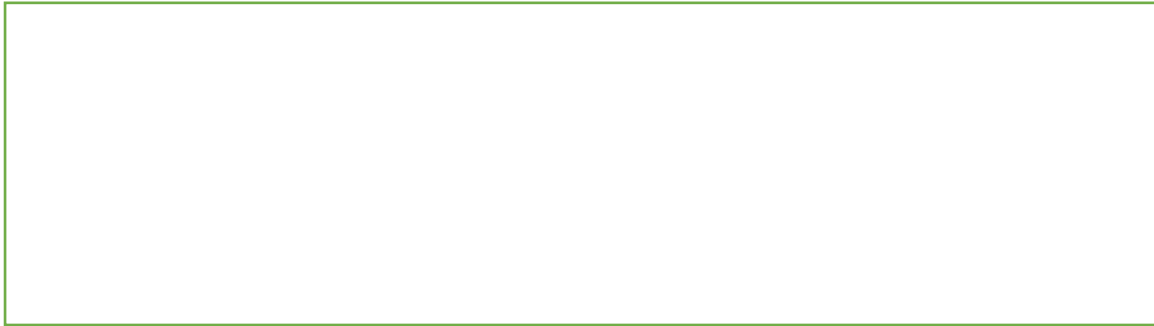## Negative and Fractional Indices

1. Prove that $x^{\frac{1}{2}} = \sqrt{x}$

2. Evaluate $27^{-\frac{1}{3}}$

3. Evaluate $32^{\frac{2}{5}}$

4. 4. Simplify $\left(\frac{1}{9}x^6y\right)^{\frac{1}{2}}$

5. Evaluate $\left(\dfrac{27}{8}\right)^{-\frac{2}{3}}$

6. If $b = \dfrac{1}{9}a^2$, determine $3b^{-2}$ in the form ka^n where k, n are constants

Extension

Let r and s be integers. Then

$$\dfrac{6^{r+s} \times 12^{r-s}}{8^r \times 9^{r+2s}}$$

is an integer if

- $r + s \leq 0$
- $s \leq 0$
- $r \leq 0$
- $r \geq s$