Essential Skills 28

The skills in this series of worksheets appear frequently.

These are the GIFTS you must take to succeed

Inverse Functions

Find $f^{-1}(x)$ for each of the following:

1. $f(x) = 6x + 1$
2. $f(x) = 6 - x$
3. $f(x) = \frac{1}{3}x - 2$
4. $f(x) = \frac{2}{5}x - 1$
5. $f(x) = \frac{x+5}{3}$
6. $f(x) = x^3 - 8,$
7. $f(x) = \sqrt{x-1}$ $\{x \geq 1\}$
8. $f(x) = 2x^3 + 1$
9. $f(x) = \frac{3}{x}$ $\{x \neq 0\}$
10. $f(x) = \frac{2}{3-x}$ $\{x \neq 3\}$

APPLYING QUESTIONS

1. Given that $f(x) = \frac{x+1}{x-3}, \{x \neq 3\}$

   Find a formula for $f^{-1}(x)$, and state a suitable domain for $f^{-1}(x)$.

2. Explain why the function $f(x) = x^2 - 1, x \in \mathbb{R}$ does not have an inverse but that the restricted function $g(x) = x^2 - 1, x \geq 0, x \in \mathbb{R}$ does.

3. The graph of $f(x) = x^3$ is shown.

   Copy it and make a neat sketch of $f^{-1}(x)$ on the same diagram.