FUNCTIONS 6: QUIZ SOLUTIONS

Question 1

A function is defined as $f(x) = 2x - 3$. What are its domain and range?

Solution

The domain of $f(x) = 2x - 3$ is $x \in R$, or $(-\infty; \infty)$ and the range is $y \in R$, or $(-\infty; \infty)$.

Question 2

A function is defined as $f(x) = 1 - 3x$. Where does its inverse cut the axes?

Solution

$$f(x) = 1 - 3x, \text{ so } f^{-1}(x) = \tfrac{1}{3} - \tfrac{1}{3}x$$

When $x = 0$, $y = \tfrac{1}{3}$, so the inverse cuts the y-axis at the point $(0; \tfrac{1}{3})$.

When $y = 0$, $x = 1$, so the inverse cuts the x-axis at the point (0; 1).

Question 3

If the inverse of a function is $f^{-1}(x) = 3x + 6$, what is the function f(x)?

Solution

$$f^{-1}(x) = 3x + 6$$
$$\text{Put } x = 3y + 6$$
$$\therefore 3y = x - 6$$
$$\therefore y = \tfrac{1}{3}x - 2 = f(x)$$

Question 4

A function is defined by $f(x) = ax + q$. Then the function and its inverse are symmetric about which line?

Solution

The line of symmetry is $y = x$, or $x - y = 0$.

Question 5

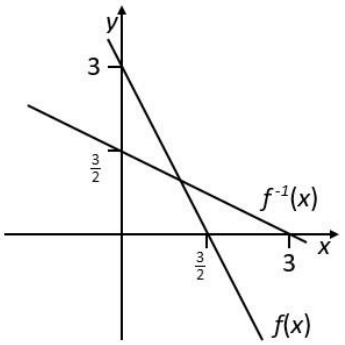
Which function and its inverse are shown by the following graph?

A. $f(x)=3-2x;\ f^{-1}(x)=\dfrac{3-x}{2}$

B. $f(x)=2x-3;\ f^{-1}(x)=\dfrac{x-3}{2}$

C. $f(x)=2x+3;\ f^{-1}(x)=\frac{1}{2}x-\frac{3}{2}$

D. $f(x)=3x+2;\ f^{-1}(x)=\frac{1}{3}x-\frac{2}{3}$



Solution

A. $f(x)=3-2x;\ f^{-1}(x)=\dfrac{3-x}{2}$