FUNCTIONS 9: QUIZ SOLUTIONS

Question 1

If $f(x) = 3^x$, what are its domain and range?

Solution

The domain of $f(x) = 3^x$ is $x \in R$, or $(-\infty; \infty)$ and the range is $y \in R$, $y > 0$, or $(0; \infty)$.

Question 2

If $f(x) = 5^x$, what is the domain and range of its inverse?

Solution

If $f(x) = 5^x$, then $f^{-1}(x) = \log_5 x$. So, the domain of the inverse is $x \in R$, $x > 0$, or $(0; \infty)$ and the range is $y \in R$, or $(-\infty; \infty)$.

Question 3

If the inverse of a certain function is $f^{-1}(x) = \log_3 x$, then which of the following describes the certain function $f(x)$?

A. $f(x)$ is a decreasing function
B. $f(x)$ is a horizontal line parallel to the x-axis
C. $f(x)$ is an increasing function
D. $f(x)$ is a vertical line parallel to the y-axis

Solution

If $f^{-1}(x) = \log_3 x$, then the certain function is $f(x) = 3^x$, which is an increasing function. So, the correct answer is C.

Question 4

A function is defined by $f(x) = ax^2$, $a > 0$, $x \geq 0$. What is the equation of the line about which the function and its inverse are symmetric?

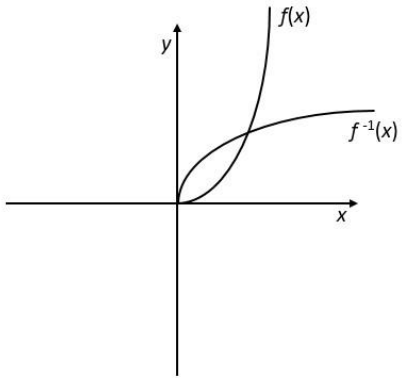
Solution

The function and its inverse are symmetric about the line $x - y = 0$, or $y = x$.

Question 5

A function and its inverse are shown in the following graph.

If the function is $f(x)=4x^2,\ x\geq 0$, what is its inverse?



A. $f^{-1}(x)=\frac{1}{2}\sqrt{x},\ x\geq 0$

B. $f^{-1}(x)=-\frac{1}{2}\sqrt{x},\ x\geq 0$

C. $f^{-1}(x)=\sqrt{\frac{x}{2}},\ x\geq 0$

D. $f^{-1}(x)=-\sqrt{\frac{x}{2}},\ x\geq 0$

Solution

A. $f^{-1}(x)=\frac{1}{2}\sqrt{x},\ x\geq 0$