

Section 2.4 – Inverse Functions

Preliminary Example. Recall the phone example from earlier, where a calling plan charged us a \$30 monthly service fee and then \$0.10 per minute for long distance calls.

t	0	30	33	36	60
C	30	33	33.30	33.60	36

For each of the following, fill in the blank and then give an interpretation of the entire statement.

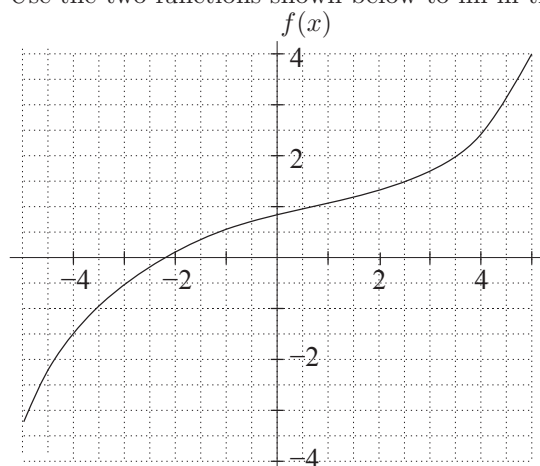
(a) $f(36) = \underline{\hspace{2cm}}$

(b) $f^{-1}(36) = \underline{\hspace{2cm}}$

(c) $f^{-1}(\underline{\hspace{2cm}}) = 33$

Examples and Exercises

1. Use the two functions shown below to fill in the blanks to the right.



x	-6	-4	-2	0	2	4	6
$g(x)$	2	0	3	7	6	1	5

- (a) $f(2) = \underline{\hspace{2cm}}$ (b) $f^{-1}(2) = \underline{\hspace{2cm}}$
- (c) $g(0) = \underline{\hspace{2cm}}$ (d) $g^{-1}(0) = \underline{\hspace{2cm}}$
- (e) $f(3) + 1 = \underline{\hspace{2cm}}$ (f) $f^{-1}(3) + 1 = \underline{\hspace{2cm}}$
- (g) $f(3 + 1) = \underline{\hspace{2cm}}$ (h) $f^{-1}(3 + 1) = \underline{\hspace{2cm}}$
- (i) If $g^{-1}(x) = 0$, then $x = \underline{\hspace{2cm}}$.

2. Let $A = f(n)$ be the amount of periwinkle blue paint, in gallons, needed to paint n square feet of a house. Explain in practical terms what each of the following quantities represents. Use a complete sentence in each case.

(a) $f(20)$

(b) $f^{-1}(20)$

3. If a cricket chirps R times per minute, then the outside temperature is given by $T = f(R) = \frac{1}{4}R + 40$ degrees Fahrenheit.

(a) Find a formula for the inverse function $R = f^{-1}(T)$.

(b) Calculate and interpret $f(50)$ and $f^{-1}(50)$.