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Web Resources

Evaluating Functions

www.mathwarehouse.com/algebra/relation/evaluating-function.php

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Evaluating Functions

I. Model Problems

In this example we will evaluate a function for a given value of x .

Example 1: If $f(x) = 3x^2 - 8$, find $f(-4)$.

Substitute -4 for x .

Simplify

$$\begin{aligned}f(x) &= 3x^2 - 8 \\f(-4) &= 3(-4)^2 - 8 \\f(-4) &= 3(16) - 8 \\f(-4) &= 48 - 8 \\f(-4) &= 40\end{aligned}$$

Answer: $f(-4) = 40$

II. Practice Problems

Evaluate each function

1. If $f(x) = -3x + 8$, find $f(5)$.
2. If $g(x) = \frac{3}{4}x + 2$, find $g(-12)$.
3. If $h(x) = \frac{-2x+5}{4}$, find $h\left(\frac{3}{2}\right)$.
4. If $g(x) = -10x + 6$, find $g(0)$.
5. If $h(x) = \frac{-5x+2}{3}$, find $h(1)$.
6. If $f(x) = 2x - 4$, find $f\left(\frac{1}{6}\right)$.
7. If $f(x) = |2x - 4|$, find $f(-7)$.
8. If $g(x) = 5|30x - 2| + 4$, find $g\left(\frac{2}{3}\right)$.
9. If $h(x) = -7|3x - 4| - 6$, find $h(-2)$.
10. If $h(x) = 24 - 3|2x + 4|$, find $h\left(-\frac{3}{2}\right)$.
11. If $g(x) = 4x^2 + 6$, find $g(3)$.
12. If $f(x) = -3x^2 - 4x + 8$, find $f(6)$.
13. If $g(x) = \frac{4x^2+5x}{2}$, find $g(3)$.
14. If $h(x) = 6x^3 + 2x^2$, find $h(-2)$.
15. If $f(x) = \sqrt{x - 6}$, find $f(15)$.
16. If $g(x) = -\sqrt{2x + 4}$, find $g(30)$.
17. If $f(x) = x^4 - 12$, find $f(-3)$.
18. If $h(x) = 2^x$, find $h(-3)$.
19. If $g(x) = 3^{x+4}$, find $g(-4)$.
20. If $f(x) = 2(4^{2x})$, find $f(-2)$.

III. Challenge Problems

1. The height in meters of a projectile at t seconds can be found by the function $h(t) = -4.9t^2 + 60t + 1.2$. Find the height of the projectile 4 seconds after it is launched..

2. A substance has a half-life of 26 years. The amount of remaining substance in grams after x years can be found with the function $h(x) = 250(0.5)^{\frac{x}{26}}$. How much substance remains after 104 years?

3. Find the error in the students work.

$$f(x) = -3x^2 - 2x + 5$$

$$f(-2) = -3-2^2 - 2 - 2 + 5$$

$$f(-2) = -3 - 4 - 2 - 2 + 5$$

$$f(-2) = -6$$

4. For what value of x are $f(x) = 4x + 9$ and $g(x) = x^2 + 13$ equivalent?
5. If $f(x) = 3x - 11$, find $-4f(-3)$.

IV. Answer Key

1. $f(5) = -7$
2. $g(-12) = -7$
3. $h\left(\frac{3}{2}\right) = \frac{1}{2}$
4. $g(0) = 6$
5. $h(-1) = -1$
6. $f\left(\frac{1}{6}\right) = \frac{15}{2}$
7. $f(-7) = 18$
8. $g\left(\frac{2}{3}\right) = 4$
9. $h(-2) = -76$
10. $h\left(-\frac{3}{2}\right) = 21$
11. $g(3) = 42$
12. $f(6) = -124$
13. $g(3) = 12$
14. $h(-2) = -40$
15. $f(15) = 3$
16. $g(30) = -8$
17. $f(-3) = 69$
18. $h(-3) = \frac{1}{8}$
19. $g(-4) = 1$
20. $f(-2) = \frac{1}{32}$

Challenge Problems

1. 162.8 m
2. 15.625 g
3. When the student substituted he failed to use parenthesis which resulted in addition rather than multiplication.
4. $x = 2$
5. $-4f(-3) = 80$