

1.(1 pt) Let $f(x) = 4x^3 + 5x^2 + 5x + 2$. Find $f(1 + \sqrt{2})$.

2.(1 pt) Let $f(x) = 3x^2 + 5x + 5$ and let $g(h) = \frac{f(2+h)-f(2)}{h}$. Determine each of the following:

- (a) $g(1) =$ _____
- (b) $g(0.1) =$ _____
- (c) $g(0.01) =$ _____

You will notice that the values that you entered are getting closer and closer to a number L . This number is called the limit of $g(h)$ as h approaches 0 and is also called the derivative of $f(x)$ at the point when $x = 2$. We will see more of this when we get to the calculus textbook.

Enter the value of L : _____

3.(1 pt) Let $f(x) = 2x^2 + 3x + 2$ and let $q(h) = \frac{f(2+h)-f(2)}{h}$. Find $q(0.01)$.

4.(1 pt)
Let $f(x) = 2x + 2$ and $g(x) = 5x^2 + 4x$.
 $(f + g)(5) =$ _____

5.(1 pt)
Let $f(x) = 2x + 3$ and $g(x) = 4x^2 + 3x$.
After simplifying,
 $(f + g)(x) =$ _____

6.(1 pt)
Let $f(x) = 3x + 2$ and $g(x) = 3x^2 + 3x$.
 $(fg)(3) =$ _____

7.(1 pt)
Let $f(x) = 4x + 4$ and $g(x) = 4x^2 + 4x$.
After simplifying,
 $(fg)(x) =$ _____

8.(1 pt) Let $f(x) = 3x^2 + x - 12$.
Find

	$f(0)$
	$f(-3)$
	$f(6)$
	$f(\sqrt{3})$
	$f(1 + \sqrt{3})$

9.(1 pt) At the surface of the ocean, the water pressure is the same as the air pressure above the water, about 15 lb/in^2 . Below the surface the water pressure increases by about 4.64 lb/in^2 for every 10 ft of descent.

Write a function $f(x)$ which expresses the water pressure in pounds per square inch as a function of the depth in inches below the ocean surface.

$f(x) =$ _____

At what depth is the pressure 110 lb/in^2 ? Include the units in your answer: _____

10.(1 pt) Let $f(x) = x^3 + 9x^2$ and $g(x) = 5x^2 - 1$.
 f/g is undefined at two points A and B where $A < B$.
 A is _____,
and B is _____

11.(1 pt) Let $f(x) = x^3 + 9x^2$ and $g(x) = 2x^2 - 12$.
 f/g is undefined at two points A and B where $A < B$.
 A is _____,
and B is _____

12.(1 pt) The altitude of a right triangle is 16 cm. Let h be the length of the hypotenuse and let p be the perimeter of the triangle. Express h as a function of p .

$h(p) =$ _____

13.(1 pt) Let $f(x)$ be the function $\frac{x}{x+1} - 1$. Find the following:

- $f(10) =$ _____
- $f(-10) =$ _____
- $f(\frac{1}{6}) =$ _____
- $f(-\frac{1}{9}) =$ _____

14.(1 pt)
Determine whether f is a function from \mathbb{Z} to \mathbb{R} .
Enter "Y" for yes and "N" for no.

- 1. $f(n) = \sqrt{n^2 + 9}$
- 2. $f(n) = 1/(n^2 + 7)$
- 3. $f(n) = \frac{1}{n^2 - 9}$
- 4. $f(n) = \pm n$

15.(1 pt) Find the following values.
(a) $\lfloor 1.1 \rfloor$

(b) $\lceil 1.1 \rceil$

(c) $\lfloor -0.1 \rfloor$

(d) $\lceil -0.1 \rceil$

(e) $\lceil 2.99 \rceil$

(f) $\lfloor -2.99 \rfloor$

(g) $\lfloor \frac{1}{2} \rfloor + \lceil \frac{1}{2} \rceil$

(h) $\lceil \lfloor \frac{1}{2} \rfloor \rceil + \lceil \frac{1}{2} \rceil + \frac{1}{2}$