

More On Evaluating Algebraic Expressions

Algebra 1

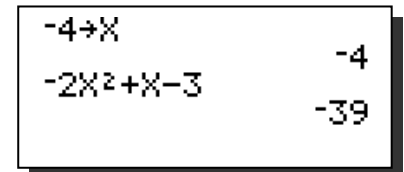
Graphing calculators have a **STORE** (**STO**) feature that will aid us in evaluating algebraic expressions. This feature allows us to store numbers in place of the variables in an algebraic expression; we can then evaluate the expression by typing it “as is” and pressing enter. We will learn this process through a series of exercises. Screen shots for the calculator are shown at the right.

Exercise #1: Evaluate $-2x^2 + x - 3$ given that $x = -4$.

Solution: step 1: **STORE** -4 for x .



step 2: Type the expression $-2x^2 + x - 3$ and press enter. (Press the " X, T, θ, n " button to get x .)

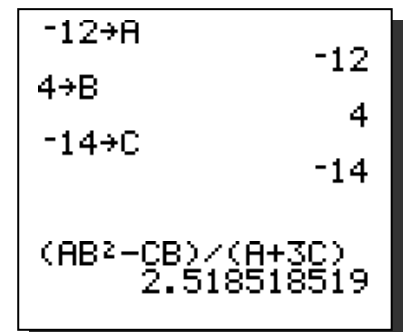


Exercise #2: Evaluate $\frac{ab^2 - cb}{a + 3c}$ given that $a = -12, b = 4,$ and $c = -14$.

Solution: step 1: **STORE** -12 for a , 4 for b , and -14 for c .

(Place the calculator in **ALPHA** mode to access the letters $A, B,$ and C .)

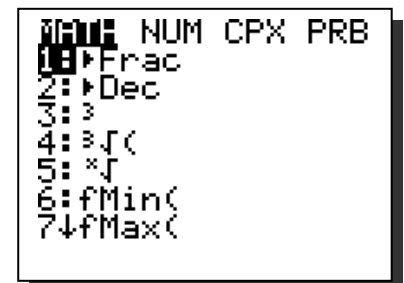
step 2: Type the expression $\frac{ab^2 - cb}{a + 3c}$ and press enter.



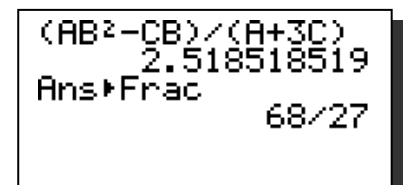
(**Always**, use parentheses to group the numerator separately from the denominator.)

step 3: If necessary, you can convert your answer to a fraction as follows:

(i) Press **MATH** and highlight **1**:



(ii) Press **ENTER** twice.



Exercise #3: Evaluate each of the following algebraic expressions for the given value of x . Use the **STORE** feature on the calculator. Convert your answer to a fraction, if it is not an integer.

(a) $4x^2 - 3x$; $x = -2.5$

(c) $-5x - 12$; $x = -42$

(b) $\frac{x - 5x^2}{16 + 3x}$; $x = 11.5$

(d) $\frac{x^2 - x - 6}{2x + 9}$; $x = -4$

Exercise #4: If $x = -33.6$, then the value of $\frac{2x + 7}{x - 3}$ is equal to

(1) $-\frac{8449}{120}$

(2) $\frac{301}{183}$

(3) $\frac{665}{339}$

(4) $\frac{37}{22}$

Exercise #5: If $V = \pi r^2 h$, then find the value of V if $r = 45.4$ and $h = 74.6$. Use the **STORE** feature on the calculator, and round your answer to the *nearest hundred*.

Exercise #6: If $c = \sqrt{a^2 + b^2}$, then find the value of c , to the *nearest tenth*, if $a = 116$ and $b = 48$. Use the **STORE** feature on the calculator, and round your answer to the *nearest tenth*.

Exercise #7: If $x = -3$, then the value of $-x^2$ is

(1) 9

(2) 6

(3) -9

(4) -6

Exercise #8: If $x = 3$, then the value of $-x^2$ is

(1) 9

(2) 6

(3) -9

(4) -6

Name: _____

Date: _____

More On Evaluating Algebraic Expressions Algebra 1 Homework

Skills

1. If $x = -4$, then find the value of each of the following algebraic expressions using the store feature on your calculator. (Note: You only need to store -4 for x once in this problem.)

a. $-18 - 242x$

b. $16x^2 - 14x$

c. $\sqrt{1072 - 3x^2}$

2. If $s = 2ab + 2bc + 2ac$, then find the value of s if $a = 125$, $b = 64$, and $c = 36$.

3. If $T = \sqrt{\frac{4\pi^2 l}{g}}$, then determine the value of T , to the *nearest tenth*, if $l = 26$ and $g = 9.8$.

4. If $a = -2$ and $b = -5$, then the numerical value of $\frac{a^2 b - 4}{a - b}$ is

(1) 17

(2) -13

(3) -8

(4) $\frac{16}{3}$

Applications

5. The height off the ground, in *feet*, of a certain baseball that travels through the air is given by the equation $h = 3.5 + 68t - 16t^2$, where t is measured in *seconds*. Find the height of the baseball, to the *nearest foot*, when $t = 3$ seconds.
6. A car accelerates along a highway for a brief period of time so that its speed v , in *feet per second*, after it has traveled d feet is given by the equation $v = \sqrt{2ad} - 10$. Find the value of v , to the *nearest tenth of a foot per second*, if $a = 32.2$ and $d = 100$ feet.

Reasoning

7. In the following exercise we will investigate how to use your calculator to justify that two algebraic expressions are equivalent.
- (a) Complete the chart below for the given values of a and b .

a	b	$(a+b)(a-b)$	$a^2 - b^2$
12	8		
35	111		
-8	-13		
41	-16		

- (b) What appears to be true regarding the quantities $(a+b)(a-b)$ and $a^2 - b^2$ for any real numbers a and b from your work in part (a) above?
8. Which of the following is equivalent to the expression $(x+5)^2$? Justify your choice.

- (1) $x^2 + 10$ (3) $2x + 25$
- (2) $x^2 + 5x + 25$ (4) $x^2 + 10x + 25$
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