QUICK
Reference Guide

ClassPad II

Press these keys for numbers, basic operations, and the most common variables

Tap any icon to select the application.

Tap Menu at any time to return to the menu screen.

Tap Main at any time to return to the **Main menu**.

Tap to advance to the next page.

In any menu application, press [Keyboard] for the onscreen keyboard.

Press [Clear] to power on. Then press [Clear] to clear commands. Press [Shift] [Clear] to power off.

Press these keys for numbers, basic operations, and the most common variables

Press [EXE] to execute commands.

CASIO

Press these keys for numbers, basic operations, and the most common variables

Main Menu

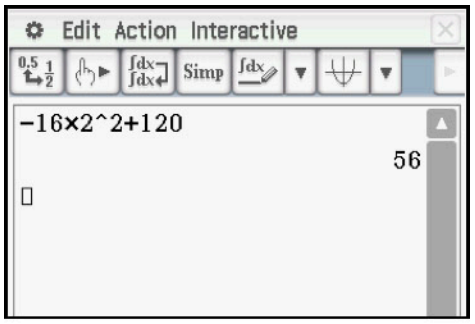
If an object, such as a ball, is dropped from a initial height, *c*, the height, *h*, in feet, as a function of time, *t*, in seconds, can be modeled by $h = -16t^2 + c$.

If the object is tossed upwards with an initial velocity, v, then the model becomes $h = -16t^2 + vt + c$. These models ignore air resistance.

1. If a ball is dropped from a height of 120 feet, compute the height after 2 seconds.

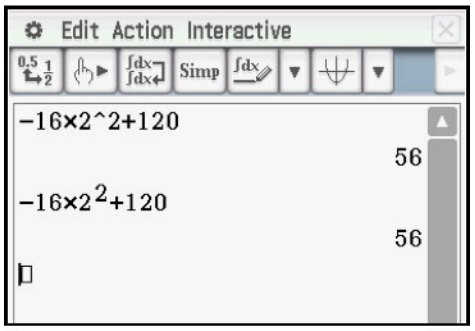
Tap Main $\sqrt{\alpha}$ for the **Main** menu.

Press:
(−) 1 6 × 2 ^ 2 + 1 2 0 EXE.



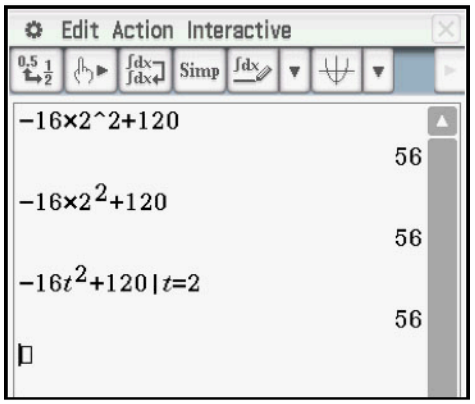
For a more mathematical display, the raised exponent template can be used from the **Math1** Keyboard.

Press:
(−) 1 6 × 2 Keyboard $\square^{\square}$ 2 ▶ + 1 2 0 EXE.



This expression can also be evaluated using a variable for substitution. A command in the form *expression* | *variable* = *value* means evaluate the expression with the given value(s) substituted for the variable(s).

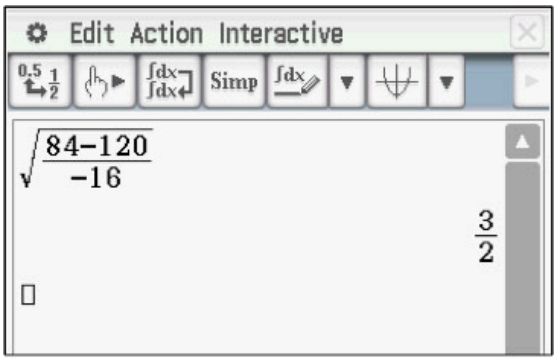
Press
(−) 1 6 Keyboard Var *t* Math1 $\square^{\square}$ 2 ▶ + 1 2 0 Math3 | Var *t* = 2 EXE.



2. Compute the time when the height of the ball is 84 feet.

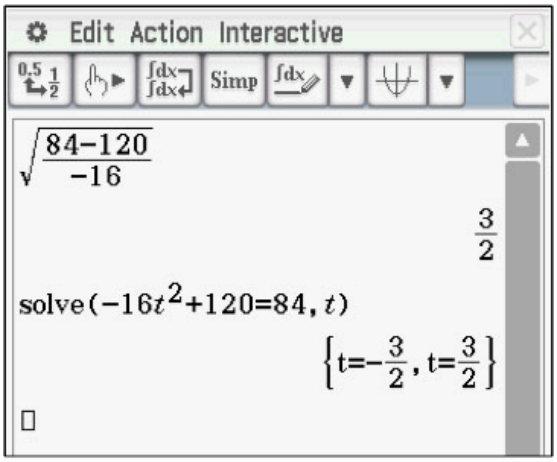
The value can be computed using the square root and fraction templates from **Math1**.

Tap
Keyboard √■ ■/■ 8 4 − 1 2 0 ▼ (−) 1 6 EXE.



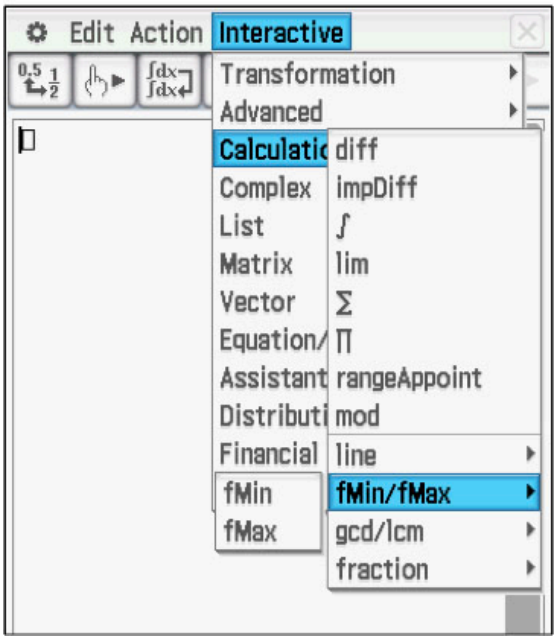
The value can also be computed using a **solve** command from **Math1**. The format is (*equation,variable*) even if there is only one variable in the equation.

Tap
Math1 solve((−) 1 6 Var Math1 ■□ 2 ▶ + 1 2 0 = 8 4 , Var t) EXE •



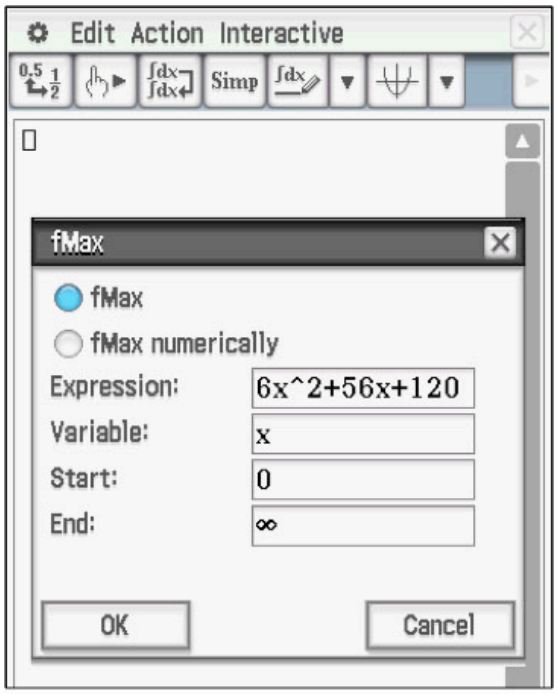
3. A ball is tossed upwards with an initial velocity of 56 feet/second, from an initial height of 120 feet. Compute the time and the height when the ball is at a maximum height.

Commands such as **fMax** are found under the **Interactive** and the **Action** menus. The **Interactive** commands open a dialogue box which gives prompts for the input. The **fMax** command uses *x* as the default variable, but another variable such as *t* can be used.



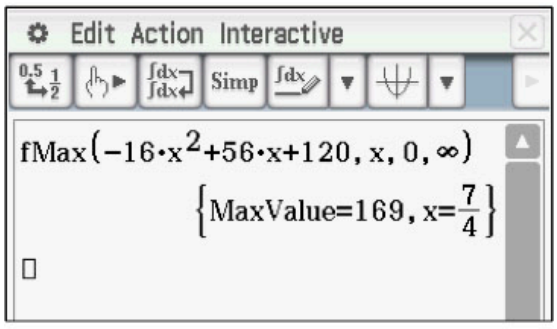
Main Menu

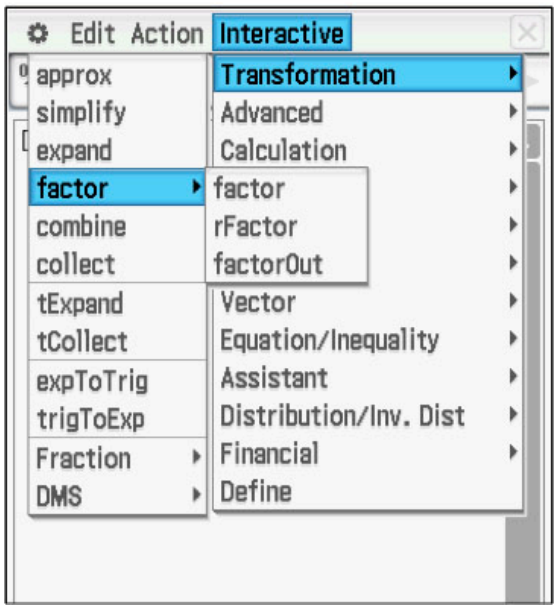
Tap **Interactive, Calculation, fMin/fMax, fMax** and complete the inputs as shown. (Part of the first coefficient, -16, has scrolled off the screen.) Then tap **OK**.



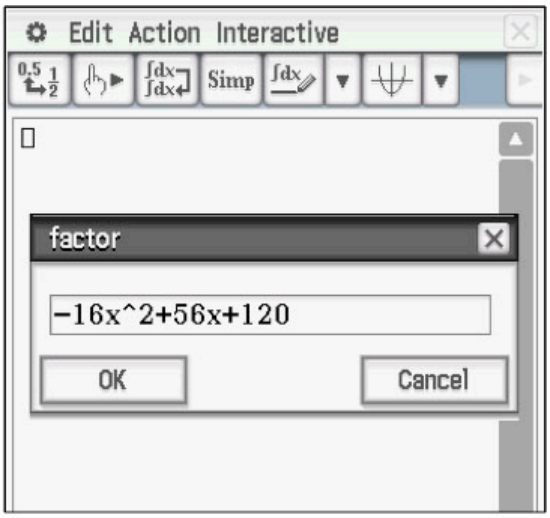
4. Rewrite the expression from Question 3 in factored form.

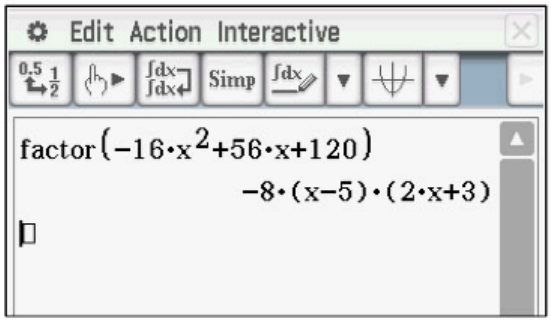
Tap **Interactive, Transformation, factor, factor.**





Enter the expression in the box. Then tap **OK**.

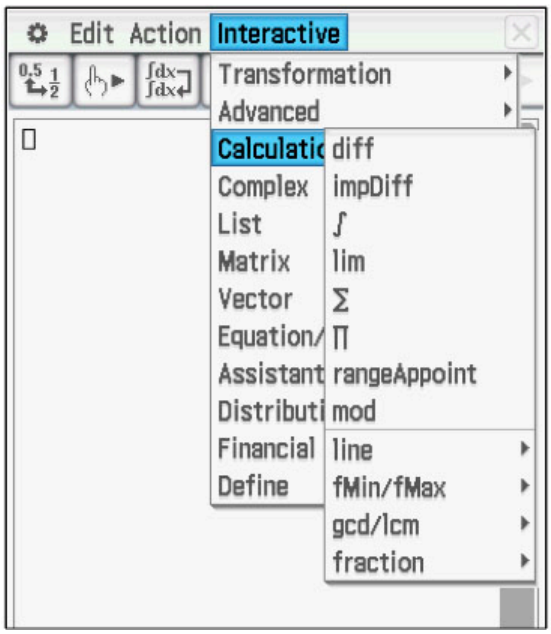




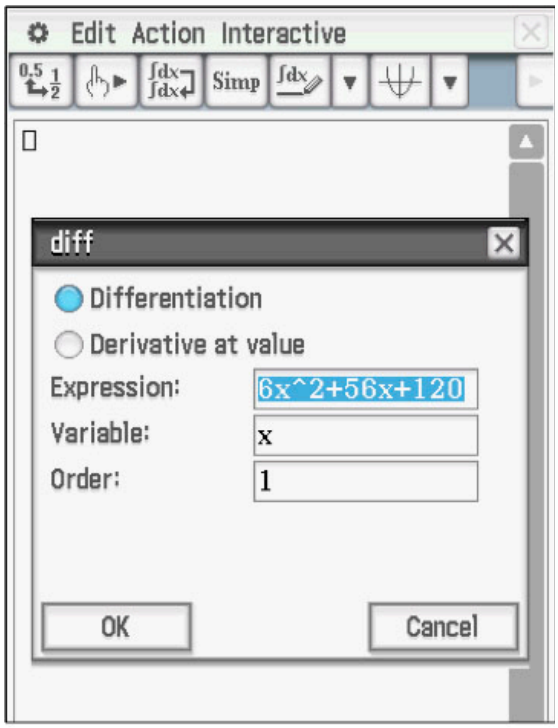
5. This model expresses height, or position, as a function of time. Construct a model for velocity as a function of time.

The velocity would be the derivative of the position function.

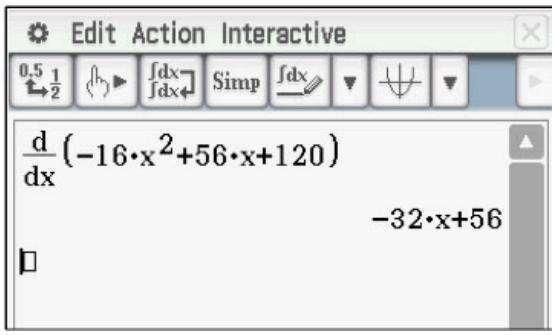
Tap **Interactive, Calculation, diff.**



Enter the expression in the box. (Again, part of the first coefficient, -16, has scrolled off the screen.) Then tap **OK**.

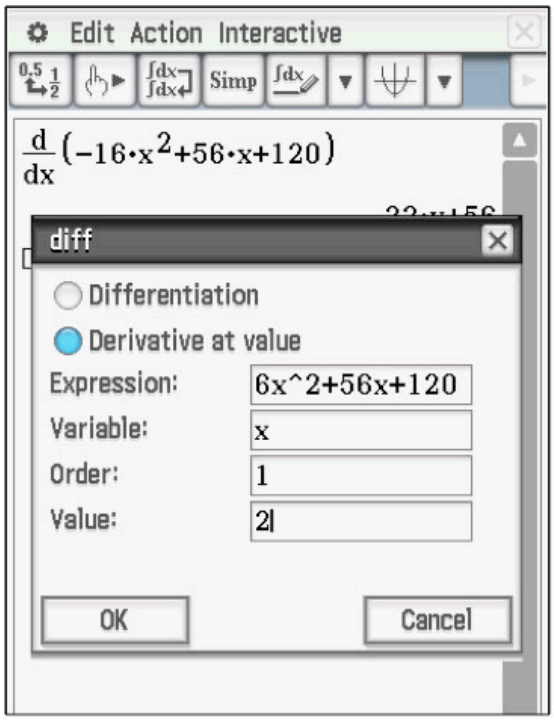


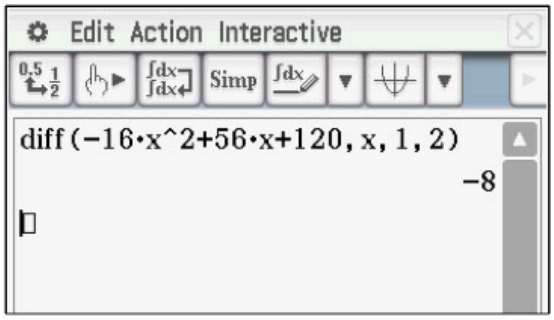
Alternately, the template for a derivative from **Math2** can be used; the result will look the same.



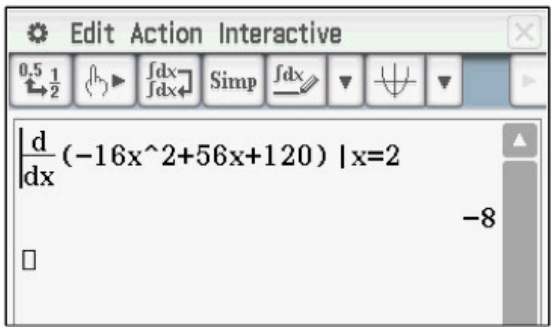
6. Compute the instantaneous velocity at time 2 seconds.

The only difference is to tap the bullet for **Derivative at value**, and to enter the value in the last box.

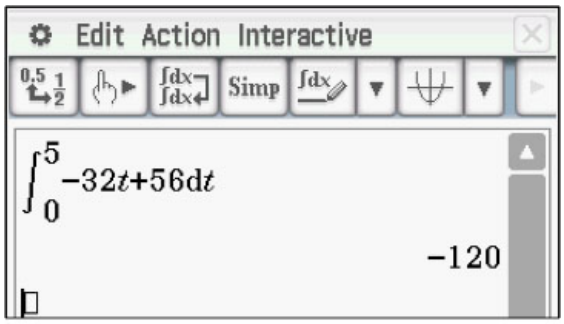




For a more intuitive display, use the derivative template from **Math2** and the "with" (|) command on **Math3**.



7. Compute the total net distance that the ball travels.



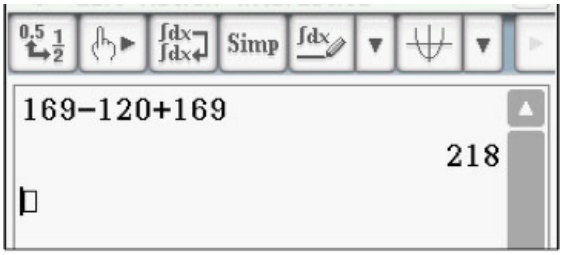
The ball had an initial height of 120 and fell to height of 0, so the net distance should be -120.

For a calculus connection, integrate the velocity function.

Tap
Keyboard Math2 .

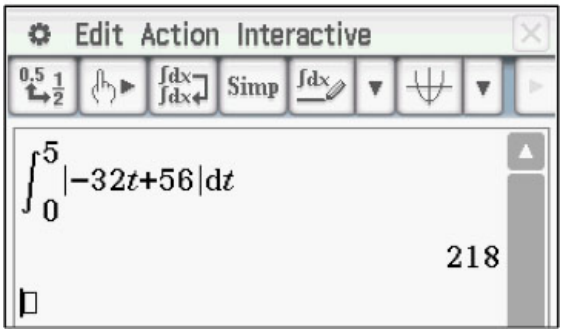
Enter the integrand, the variable, and the limits. The variable t can be found at Math2, then tap EXE.

8. Compute the total distance that the ball travels.



The initial height and the maximum height are known, so the total distance can be easily computed.

For another calculus connection, another integral can be used. The traditional approach is to use two integrals, but it is quicker to use the absolute value template. The template is also in Math2.

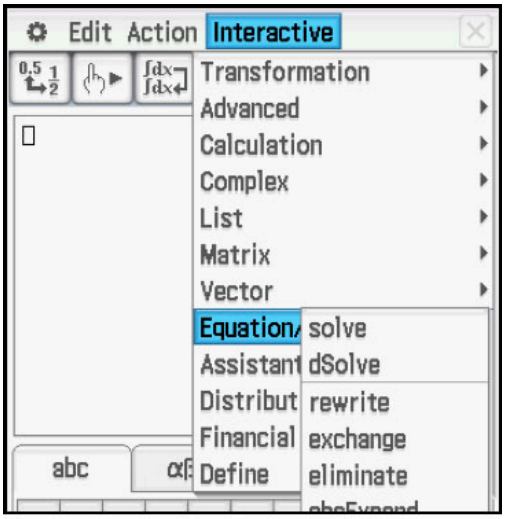


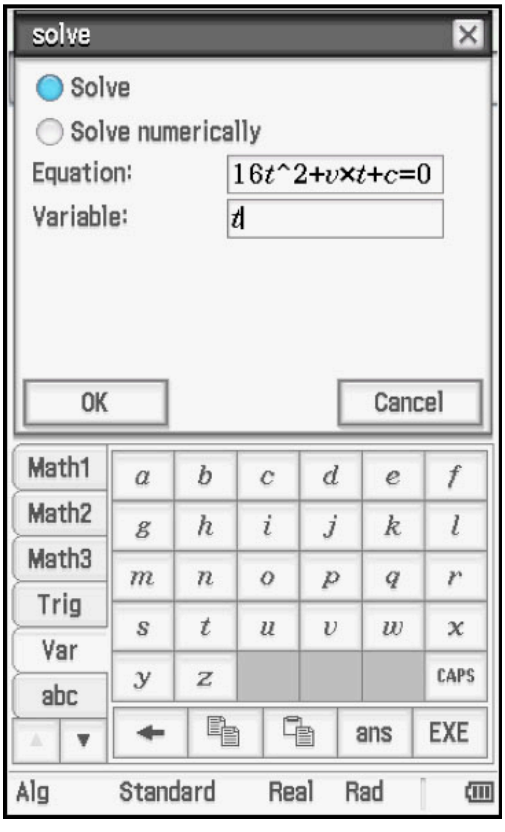
Main Menu

The ClassPad has a symbolic algebra system, sometimes called a computer algebra system, or CAS. An important distinction is a calculator using symbolic algebra can manipulate undeclared variables. The factoring example from Question 4 was an illustration. It is usually a good idea to tap **Edit**, then **Clear All Variables** to ensure that the variables do not have a value stored in memory. The next 2 questions illustrate additional symbolic algebra.

9. If a model for the height of a ball thrown upwards as a function of time is given by $h = -16t^2 + vt + c$, compute an expression for the time when the ball hits the ground.

Tap **Interactive, Equation, solve.**

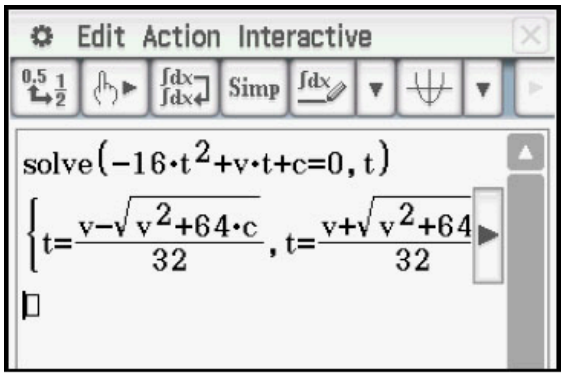




Enter the equation in the box by pressing Keyboard and tap abc to view the variables. The negative sign is to the left of 16 and has scrolled off.

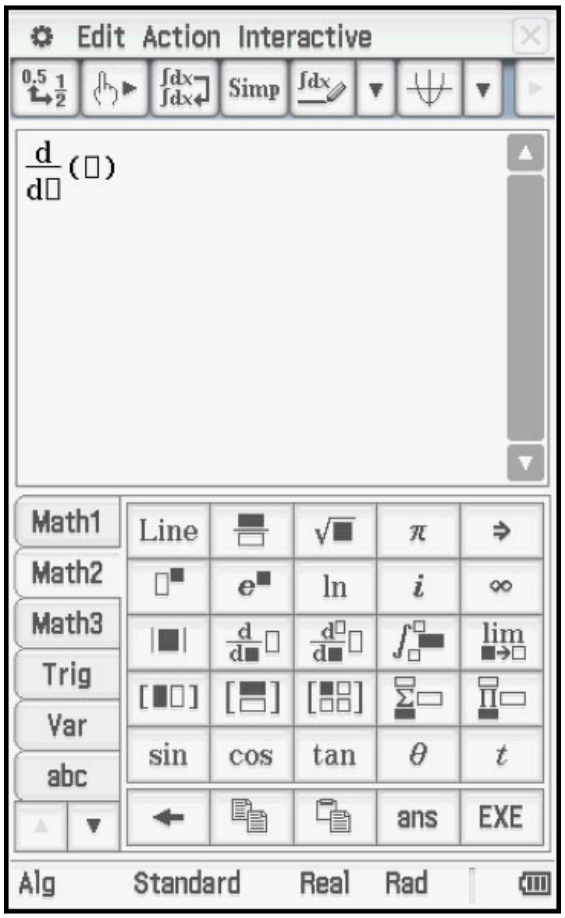
Enter the variable in the second box and tap EXE, or press the EXE key; then tap **OK**.

Both solutions are shown; the first solution would be negative and is not in the domain.



10. If a model for the height of a ball, thrown upwards, as a function of time, is given by $h = -16t^2 + vt + c$, compute an expression for velocity as a function of time.

Press
Keyboard and tap Math2 $\frac{d}{dx}$.



Enter the expression and the variable and tap EXE, or press the EXE key.