

Goal: To use internet resources to solve equations.

There are websites that will solve equations and inequalities for us. We will look at one today: [www.wolframalpha.com](http://www.wolframalpha.com). To extend the lesson you may find others and include on your worksheet what they are with examples. It is important to know how to enter equations properly, so you may need to do some searching on how to enter certain mathematical operations such as exponents and absolute value (often this will be very similar to your graphing calculator).

When you go to the website, the first page should look like this.



To solve an equation, type it in the box and press the Enter key or click on the = button. For example, to solve the equation  $5x - 12 = 15$  the screen should look like this.

The screenshot shows the WolframAlpha website interface. At the top, the browser title is "Wolfram|Alpha: Computational Knowledge Engine - Windows Internet Explorer". The address bar shows the URL "http://www.wolframalpha.com/". The page has a yellow background with a white search box in the center. The search box contains the equation "5x-12=15" and a red "=" button. Above the search box, the text "Enter what you want to calculate or know about" is displayed, along with "Examples" and "Random" links. The WolframAlpha logo is positioned above the search box. Below the search box, there is a link to "Introducing the latest Wolfram Reference Apps: Wolfram Words & Mortgage Calculator". The footer contains navigation links: "About", "Products", "Mobile Apps", "Business Solutions", "For Developers", "Resources & Tools", "Blog", "Forum", "Participate", "Contact", and "Connect" with social media icons. The copyright notice at the bottom reads "©2011 Wolfram Alpha LLC—A Wolfram Research Company". The Windows taskbar at the bottom shows the system tray with the date "10/27/2011" and time "11:27 AM".



When you click the = button you will see a screen that looks like this.

The screenshot shows the WolframAlpha website interface. At the top, the browser window title is "5x-12=15 - WolframAlpha - Windows Internet Explorer" and the address bar shows "http://www.wolframalpha.com/input/?i=5x-12%3D15". The main content area features the WolframAlpha logo and a search input field containing "5x-12=15". Below the input field, the text "Input:  $5x - 12 = 15$ " is displayed. A graph titled "Plot:" shows two lines: a blue line representing  $y = 5x - 12$  and a red horizontal line representing  $y = 15$ . The intersection point is marked with a red dot at  $x = 27/5$ . The x-axis ranges from -1 to 6, and the y-axis ranges from -15 to 20. Below the graph, the text "Alternate forms:" is visible. On the right side of the page, there is a promotional message: "Like WolframAlpha? You'll love Mathematica" with a heart icon.

Scroll down to see the solution of  $27/5$ . You will also see some other information about your equation. The graphs are done as if each side was equal to  $y$ . So the blue one is  $y=5x - 12$  and the other one is  $y=15$ . The  $x$ -coordinate of the intersection point is the solution of the equation. The program also gives alternate forms of the equation which are equations that have the same solution as your equation. There is even a number line displaying the solution.

Your assignment is to use [www.wolframalpha.com](http://www.wolframalpha.com) to solve the equations and answer the questions on the following worksheet. You may print the worksheet and turn it in when we return to school. If you do not have a printer, you may write the questions and your solutions on a piece of paper and turn that in when we return.

# CALCULUS

## eDay Lesson 1 – Equations

Date: \_\_\_\_\_

Name: \_\_\_\_\_

Use [www.wolframalpha.com](http://www.wolframalpha.com) to solve the following differential equations. (Recall that a differential equation is an equation containing a derivative.)

1.  $\frac{dy}{dx} = \frac{y}{x}$

2.  $\frac{dy}{dx} = \frac{x}{y}$

3.  $\frac{dy}{dx} = -\frac{y}{x}$

4.  $\frac{dy}{dx} = xy$

5.  $y' = xe^x$

6.  $y'' = -9.8$

7.  $y' = xe^y$

8.  $y' + 2y = 2e^x$

9.  $xy' + y = -xy^2$

10.  $y' = x + y$