

Desmos/Math Tech Workshop

Presented by the QSC

Open <https://www.desmos.com/calculator>

<https://help.desmos.com/hc/en-us/articles/4406040715149-Getting-Started-Desmos-Graphing-Calculator>

Part 1: Graphing a line

1. Plot the point (2,3) and (-2,5). Label the points.
2. Graph the line $y = -\frac{1}{2}x + 4$
3. Use the table function to find 4 more points on the line.

4. What is the y-value when the x-value is 400?

5. What are the x and y intercepts?

6. Change the color of the line.
7. Make the line dashed.

8. Find a line that is perpendicular to the original line. Record two points that exist on the perpendicular line. Change the color of this line.

9. Find a line that is parallel to the original line. Record two points that exist on the parallel line. Change the color of this line.

Part 2: Systems of Equations

1. Graph the lines $y = \frac{3}{2}x$ and $y = -\frac{1}{2}x + 4$
 - a. What is the solution to the system of equations?

 - b. Find a line that is parallel to the line $y = \frac{3}{2}x$. How many solutions do you have?

 - c. Find an equation of a line that completely overlaps the line $y = \frac{3}{2}x$. How many solutions do you have?

2. Graph the function $x^2 + y^2 = 81$. What shape is this?
 - a. Graph a line that intersects the previous function. Write down the equation.

 - b. What are the solution(s) to the system of equations you created?

 - c. Graph a parabola that intersects the previous function. Write down the equation.

 - d. What are the solution(s) to the system of equations you created?

Part 4: Finding all roots of a polynomial

1. Graph the function $y = x^4 + 2x^3 + 22x^2 + 50x - 75$. Find all the roots (real and imaginary).

Part 6: Word Problems

A rocket is shot vertically up in the air from the ground level. Its distance d , in feet, after t seconds is given by $d(t) = 96t - 15t^2$.

- What is the maximum height of the rocket?
- At what time does the rocket reach its maximum height?
- What is the horizontal distance traveled before the rocket hits the ground?

You put \$100 into a bank account where the interest compounds monthly at a rate of 10%. Let $A(t)$ represent the amount in the bank account after t years. The growth of the bank account can be modeled by $A(t) = 100 \left(1 + \frac{0.10}{12}\right)^{12t}$.

- How long will it take for your money to double?
- How long will it take for your money to triple?
- Based on the function and your answers to parts a) and b), what kind of function is $A(t)$?

Suppose there is a bank that gives you \$20 each year. Let $M(t)$ represent the amount in the bank account after t years. The growth of the bank account can be modeled by $M(t) = 100 + 20t$.

- How long would it take for your money to double?
- How long would it take for your money to triple?
- When do the accounts have the same amount of money? Would you invest your money at the bank where the growth is modeled by $A(t)$ or $M(t)$? Why?

Workshop Survey:



QSC Workshops:

