

## Desmos and Using Sliders

Problems below are grouped into 3 categories – Marginal, Probable, and Almost Certainly, reflecting the odds that Desmos might be useful. Some students will use Desmos for everything, in which case all 3 categories likely to use Desmos, whereas other students will almost never use Desmos, in which case only the “Almost Certainly” problems would be solved with Desmos. And obviously there is a spectrum on which students will fall depending on how much they think Desmos will be helpful. Feel free to use Desmos or solve with scrap paper and calculator depending on your confidence level.

Marginal (Likely Desmos is more trouble than it’s worth?)

1. In the  $xy$ -plane, line  $t$  passes through the points  $(0,9)$  and  $(1,17)$ . Which equation defines line  $t$  ?
  - A)  $y = \frac{1}{8}x + 9$
  - B)  $y = x + \frac{1}{8}$
  - C)  $y = x + 8$
  - D)  $y = 8x + 9$
  
2. In the  $xy$ -plane, line  $p$  has a slope of  $-\frac{5}{3}$  and an  $x$ -intercept of  $(-6,0)$ . What is the  $y$ -coordinate of the  $y$ -intercept of line  $p$  ?

Probable (decent chance Desmos will be helpful)

1. (tough problem – show how to do sqrt)... The function  $f$  is defined by  $f(x) = a * \sqrt{x + b}$ , where  $a$  and  $b$  are constants. In the  $xy$ -plane, the graph of  $y = f(x)$  passes through the point  $(-24,0)$ , and  $f(24) < 0$ . which of the following must be true?
  - A)  $f(0) = 24$
  - B)  $f(0) = -24$
  - C)  $a > b$
  - D)  $a < b$

$$y - 9x = 13$$

$$5x = 2y$$

2. What is the solution  $(x, y)$  to the given system of equations?

- A)  $(\frac{5}{2}, 1)$
- B)  $(1, \frac{2}{5})$
- C)  $(-2, -5)$
- D)  $(-5, -2)$

3. The function  $g$  is defined by  $g(x) = (x + 14)(t - x)$ , where  $t$  is a constant. In the  $xy$ -plane, the graph of  $y = g(x)$  passes through the point  $(24, 0)$ . What is the value of  $g(0)$  ?

4. What is the  $y$ -coordinate of the  $y$ -intercept of the graph of  $\frac{3x}{7} = -\frac{5y}{9} + 21$  in the  $xy$ -plane?

$$w^2 + 12w - 40 = 0$$

[rewrite using  $x$  instead of  $w$ , and then either set equal to 0 or set equal to  $y$ ] IF YOU REALLY DON'T LIKE QUADRATIC EQUATION CAN JUST GRAPH and then plug each answer into the calculator

5. Which of the following is a solution to the given equation?

- A)  $6 - 2\sqrt{19}$
- B)  $2\sqrt{19}$
- C)  $\sqrt{19}$
- D)  $-6 + 2\sqrt{19}$

Almost certainly (Desmos likely will make life much easier)

$$y = 18$$

$$y = -3(x - 18)^2 + 15$$

1. If the given equations are graphed in the  $xy$ -plane, at how many points do the graphs of the equations intersect?
  - A) Exactly one
  - B) Exactly two
  - C) Infinitely many
  - D) Zero

$$y = x + 9$$

$$y = x^2 + 16x + 63$$

2. A solution to the given system of equations is  $(x, y)$ . What is the greatest possible value of  $x$ ?
  - A)  $-6$
  - B)  $7$
  - C)  $9$
  - D)  $63$
  
3. Which quadratic equation has no real solutions?
  - A)  $x^2 + 14x - 49 = 0$
  - B)  $x^2 - 14x + 49 = 0$
  - C)  $5x^2 - 14x - 49 = 0$
  - D)  $5x^2 - 14x + 49 = 0$

## Answers

### Marginal

1. D
2. -10

### Probable

1. D
2. C
3. 336
4.  $189/5$ , or 37.8
5. D

### Almost Certainly

1. D
2. A
3. D