Name: Date:

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Spinner Rotation vs Time - Linear

The tasks in this handout refer to three outside resources: 1) the Spinner Simulator; 2) the Spinner Simulation Tasks; and 3) the Spinner Rotation Videos. These resources can be found online at the Spinner Math homepage at http://www.harryomalley.com/spinnermath.

Math To Simulations To Words

Let *x* = time, in seconds and *f(x)* = spinner rotation, in degrees. Let $f(x) = 20x, \ \ 0 \le x \le 5$ describe the relationship between rotation and time for the spinner. Using the Spinner Simulator, find the value of $f(0), f(1), f(2), f(3), f(4),$ and $f(5)$ and be prepared to explain the meaning of the input and output for each. Fill out your answers in the table below.

x	$f(x)$
0	
1	
2	
3	
4	
5	

Without pressing the Play button on the Spinner Simulator, try using the data in the table to describe, in your own words, what the spinner does from 0 to 5 seconds.

Press the play button on the Spinner Simulator to watch what the spinner does. Add more detail to your description below based on anything new that you notice from the simulation:

Words to Words

Each of the following shows precise and accurate language to use when describing a spinner that is spinning according to the functions in this module. For each one, read it and rehearse it in your head until you think you can re-write it without looking at it. Then try to write it. Only look if you really need to.

1. A spinner rotates at a constant speed of 20 degrees per second from 0 seconds to 5 seconds.

2. A spinner rotates at a constant speed of -100 degrees per second from 8 seconds to 17 seconds.

Math to Simulation to Words

For each problem, mentally predict what its simulation will do. Then simulate it. Finally, for each one, describe the rotation of the spinner over time in words.

3. $f(x) = 30x$, $0 \leq x \leq 20$

4. $f(x) = x$, $10 \leq x \leq 50$

5. $f(x) = 150x$, $12.5 \leq x \leq 52.5$

6. $f(x) = -150x$, $12.5 \leq x \leq 52.5$

Words to Math to Simulation

Translate the following descriptions into mathematical functions. Verify your results by simulating them.

7. A spinner rotates at a constant speed of 50 degrees per second from 0 seconds to 10 seconds.

8. A spinner rotates at a constant speed of -300 degrees per second from 15 seconds to 35 seconds.

9. A spinner rotates at a constant speed of 12.5 degrees per second from 30 seconds to 75 seconds.

10. A spinner rotates at a constant speed of 1000 degrees per second from 1 seconds to 3 seconds.

Simulation to Simulation

Problems 11-14 involve completing the 4 Linear Spinner Simulation Tasks online. The answer to each puzzle is a function. Once you've solved each puzzle, record the answer function below.

11. _____

12. _____

13. _____

14. _____

Concrete to Words

Problems 15 and 16 involve watching the Linear Spinner Rotation Video. In the video, there are two different spinner rotation sequences. Describe each rotation sequence in words.

15. Description of the first spinner movement:

16. Description of the second spinner movement:

Concrete to Math to Simulation

Problems 17 and 18 involve watching the Linear Spinner Rotation Video. In the video, there are two different spinner rotation sequences. Write a function to describe each. Verify your results by simulating them.

17. Function for the first spinner movement:

18. Function for the second spinner movement:

Concrete to Concrete

Problems 15 and 16 involve watching the Linear Spinner Rotation Video and trying to copy what you see using your own fidget spinner and straw. For best results controlling the spinner with your straw, use a flexible elbow straw. Lay the straw flat on the surface that the spinner is on and bend the elbow up to blow. Having the straw laying flat on the surface makes controlling the spinner a lot easier.

19. I recreated the first spinner movement:

20. I recreated the second spinner movement:

☐

☐

Math to Concrete

Using a real fidget spinner, translate the following math functions into reality. Check off each one when you finish.

☐ 21. $f(x) = 40x, \ 0 \le x \le 8$

☐ 22. $f(x) = -40x, \ 0 \le x \le 8$

☐ 23. $f(x) = 540x, \ 3 \le x \le 9$

☐ 24. $f(x) = -3600x, \ 5 \le x \le 10$

Words to Concrete

Translate the following descriptions into reality. In other words, make your spinners do what these words describe. Check off each one when you're finished.

☐ 25. A spinner rotates at a constant speed of 20 degrees per second from 0 seconds to 10 seconds.

☐ 26. A spinner rotates at a constant speed of -300 degrees per second from 15 seconds to 35 seconds.

☐ 27. A spinner rotates at a constant speed of 12.5 degrees per second from 30 seconds to 75 seconds.

☐ 28. A spinner rotates at a constant speed of 1000 degrees per second from 1 seconds to 3 seconds.

Manifest

Create your own spinner rotation. Describe it in words and math symbols. Then simulate it and make it a reality with your spinner. Post your results at #spinnermath !