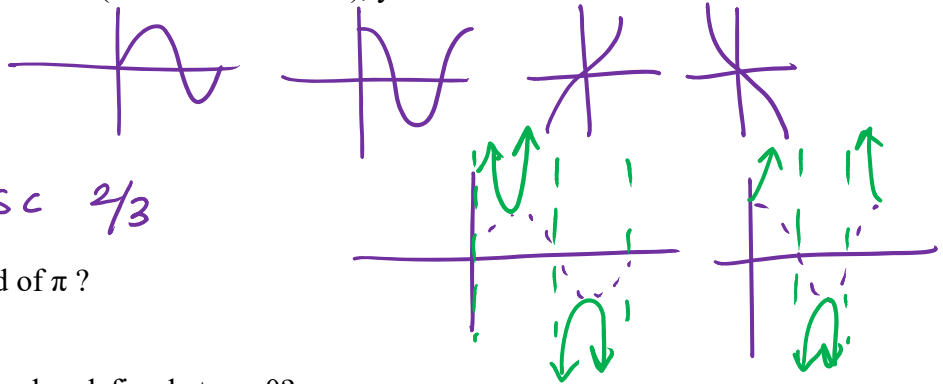


Probability and Algebra 2/Trig Honors Unite!

1. Of the six basic trigonometric functions (no transformations), your teacher selects one at random to include on the final exam.

What is the probability she selects:



a. An odd function?

\sin, \tan, \cot, \csc $\frac{2}{3}$

b. A function with a period of π ?

\tan, \cot $\frac{1}{3}$

c. A function that is even and undefined at $x = 0$?

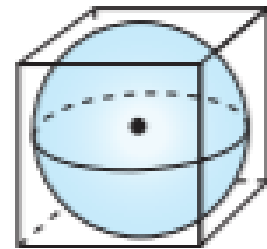
0

2. Describe a real-life event that has a probability of 0.

The sky will fall

3. A sphere fits inside a cube so that it touches each side, as shown. What is the probability a point chosen at random inside the cube is also inside the sphere?

Hint: Volume of a cube with radius, r , is: $V(r) = \frac{4}{3}\pi r^3$



$$\text{Prob} = \frac{\frac{4}{3}\pi r^3}{(2r)^3} = \frac{\frac{4}{3}\pi}{8} = \frac{4\pi}{24} = \frac{\pi}{6}$$

4. Consider the graph of $f(x)$ shown.

What is the probability that the graph of $y = f(x) + c$ intersects the x -axis when c is a randomly chosen integer from 1 to 6? Explain.

$$x^2 - 4 + 1 = x^2 - 3$$

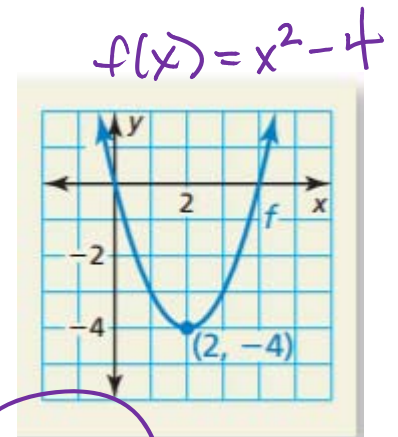
$$x^2 - 4 + 2 = x^2 - 2$$

$$x^2 - 4 + 3 = x^2 - 1$$

$$x^2 - 4 + 4 = x^2$$

~~$$x^2 - 4 + 5 = x^2 + 1$$~~

~~$$x^2 - 4 + 6 = x^2 + 2$$~~



$\frac{2}{3}$

5. Describe a real-life event that has a probability of 1.

The sun will rise.

6. You are trying to create a polynomial that can be factored over the integers (no square roots or imaginary numbers!). So far, you have: $x^2 - 2x - k$.

If you randomly select a whole number from 1 to 25 for k , what is the probability that your polynomial will be factorable over the integers?

No $x^2 - 2x - 1$
 No $x^2 - 2x - 2$
 Yes $x^2 - 2x - 3$
 etc

Need a value of k that has factors that differ by 2

$3, 1 \Rightarrow 3 = k$ $6, 4 \Rightarrow 24 = k$
 $4, 2 \Rightarrow 8 = k$
 $5, 3 \Rightarrow 15 = k$

$\frac{4}{25}$

7. Amber is analyzing the function $g(x)$, shown here: $g(x) = \frac{(x^2 + 2x - 15)(x^2 - 64)}{(x \pm p)(x - 3)}$

If she rolls a 12-sided die and uses that value for p , what is the probability $g(x)$ will have a removable discontinuity? [Note that the factor can be $(x + p)$ or $(x - p)$]

$g(x) = \frac{(x+5)(x-3)(x+8)(x-8)}{(x \pm p)(x-3)}$ $p = 5, 3, 8$

$\frac{3}{12} = \frac{1}{4}$



How would this probability change if Amber used a 6-sided die instead?



$p = 3, 5$

$\frac{2}{6} = \frac{1}{3}$