

Purpose: In this problem set, you will be utilizing your skills with trigonometry to answer questions in scenarios determined at random! Beware that not all rolls of the dice will be reasonable.

1. You will need one triple die.

(a) Roll the triple die.

Blue: _____ Red: _____ White: _____

(b) Create a circle with center (blue, red) and radius given by the white die. Write the equation for this circle and sketch it below.

(c) Find the area and circumference of this circle.

2. Let's do it again! You will need one triple die.

(a) Roll the triple die.

Blue: _____ Red: _____ White: _____

(b) Create a circle with center (blue, red) and radius given by the white die. Write the equation for this circle and sketch it below.

(c) Find the area and circumference of this circle.

3. You will need a triple die and a double die.

(a) Roll the triple die.

Blue: _____ Red: _____ White: _____

(b) Multiply all three values together: _____.

(c) This number is now a degree measurement. What quadrant is it in?

(d) Convert the degree measurement to radians.

(e) Roll one double die. Inside: _____ Outside: _____

(f) Add the values together. This is now the radius of a circle: _____

(g) What is the arc length subtended by your angle on a circle of your radius?

4. Let's do it again (with one change at the end)! You will need a triple die.

(a) Roll the triple die.

Blue: _____ Red: _____ White: _____

(b) Multiply all three values together: _____.

(c) This number is now a degree measurement. What quadrant is it in?

(d) Convert the degree measurement to radians.

(e) Roll one double die. Inside: _____ Outside: _____

(f) Add the values together. This is now the radius of a circle: _____

(g) What is the area of the sector subtended by your angle on a circle of your radius?

5. You will need two double dice.

(a) Roll one double die. Inside: _____ Outside: _____

(b) Create a radian value as follows: $\frac{(\text{inside})\pi}{(\text{outside})}$: _____

(c) Which quadrant is this angle in?

(d) Convert this radian measurement to degrees.

(e) Roll one double die. Inside: _____ Outside: _____

(f) Add the values together. This is now the radius of a circle: _____

(g) What is the arc length subtended by your angle on a circle of your radius?

6. Let's do it again (with one change at the end)! You will need one double die.

(a) Roll the double die. Inside: _____ Outside: _____

(b) Create a radian value as follows: $\frac{(\text{inside})\pi}{(\text{outside})}$: _____

(c) Which quadrant is this angle in?

(d) Convert this radian measurement to degrees.

(e) Roll one double die. Inside: _____ Outside: _____

(f) Add the values together. This is now the radius of a circle: _____

(g) What is the area of the sector subtended by your angle on a circle of your radius?

7. You will need a black signed number die and a blue signed number die.

(a) Roll one black signed number die: _____

(b) Roll one blue signed number die: _____

(c) Write a coordinate pair using your two dice in the form (black die, blue die): (_____, _____)

(d) Draw the point on the coordinate axes below and connect this point to the origin. Draw the angle that terminates at this ray and name it θ .

(e) Compute $\sin(\theta)$, $\cos(\theta)$, $\tan(\theta)$, $\sec(\theta)$, $\csc(\theta)$, and $\cot(\theta)$.

8. We're going to do it again! You will need a black signed number die and a blue signed number die.

(a) Roll one black signed number die: _____

(b) Roll one blue signed number die: _____

(c) Write a coordinate pair using your two dice in the form (black die, blue die): (_____, _____)

(d) Draw the point on the coordinate axes below and connect this point to the origin. Draw the angle that terminates at this ray and name it θ .

(e) Compute $\sin(\theta)$, $\cos(\theta)$, $\tan(\theta)$, $\sec(\theta)$, $\csc(\theta)$, and $\cot(\theta)$.

9. Make your own question and trade with a partner!