13.3

Unit Circle

Warm-up

Solve for x and y



I do:

Use the unit circle to find the exact value of each trigonometric function.

1. sin210$°$

cos210$°$

tan210$°$

|  |  |
| --- | --- |
| Find the coordinates for the angle on the unit circle. | Macintosh HD:Users:wyen:Desktop:Screen Shot 2015-03-12 at 8.21.01 AM.png$$(-\frac{\sqrt{3}}{2},-\frac{1}{2})$$ |
| $$sinθ=y$$$$ cosθ=x$$$$tanθ=\frac{y}{x}$$ | $$sin210°=y=-\frac{1}{2}$$$$ cos210°=x=-\frac{\sqrt{3}}{2}$$$$tan210°=\frac{y}{x}=-\frac{1}{2}÷-\frac{\sqrt{3}}{2}=$$$-\frac{1}{2}∙\left(-\frac{2}{\sqrt{3}}\right)=\frac{1}{\sqrt{3}} ∙\frac{\sqrt{3}}{\sqrt{3}}$=$ \frac{\sqrt{3}}{3}$ |

We try:

Use the unit circle to find the exact value of each trigonometric function.

$$sin\frac{2π}{3}$$

$$cos\frac{2π}{3}$$

$$tan\frac{2π}{3}$$

csc$\frac{2π}{3}$

sec$\frac{2π}{3}$

cot$\frac{2π}{3}$

|  |  |
| --- | --- |
| Find the coordinates for the angle on the unit circle. | Macintosh HD:Users:wyen:Desktop:Screen Shot 2015-03-12 at 8.21.01 AM.png |
| $$sinθ=y$$$$ cosθ=x$$$$tanθ=\frac{y}{x}$$ |  |

You Try:

Even Write, Odd Talk

Use the unit circle to find the exact value of each trigonometric function.

$$sin90°$$

$$cos90°$$

$$ tan90°$$

I do:

Use a reference angle to find the exact value of sine, cosine, and tangent of 225$°$

|  |  |
| --- | --- |
| Find reference angle. | Macintosh HD:Users:wyen:Desktop:Screen Shot 2015-03-12 at 9.19.40 AM.png |
| Find coordinates of reference angle. | Macintosh HD:Users:wyen:Desktop:Screen Shot 2015-03-12 at 9.20.22 AM.png$$(\frac{\sqrt{2}}{2},\frac{\sqrt{2}}{2})$$ |
| Adjust signs for the quadrant.Q1(+,+)Q2(-,+)Q3(-,-)Q4(+,-) | 225$°=Q3, (-,-)$$$(-\frac{\sqrt{2}}{2},-\frac{\sqrt{2}}{2})$$ |
| Solve for sin$θ$=y$cosθ$=xtan$θ$=$\frac{y}{x}$ | Sin225$°=-\frac{\sqrt{2}}{2}$Cos$225°$=$-\frac{\sqrt{2}}{2}$Tan225$°=$1 |

We do:

Use a reference angle to find the exact value of sine, cosine, and tangent of 150$°$

|  |  |
| --- | --- |
| Find reference angle. |  |
| Find coordinates of reference angle. |  |
| Adjust signs for the quadrant.Q1(+,+)Q2(-,+)Q3(-,-)Q4(+,-) |  |
| Solve for Sin$θ$=y$cosθ$=xtan$θ$=$\frac{y}{x}$ |  |

You do with your partner.

Even Talk, Odd Write.

Use a reference angle to find the exact value of sine, cosine, and tangent of 330$°$

|  |  |
| --- | --- |
| Find reference angle. |  |
| Find coordinates of reference angle. |  |
| Adjust signs for the quadrant.Q1(+,+)Q2(-,+)Q3(-,-)Q4(+,-) |  |
| Solve for Sin$θ$=y$cosθ$=xtan$θ$=$\frac{y}{x}$ |  |

Closure:

Take a minute and think about the steps needed to find the exact value of sin150$°$. How would you solve it using the unit circle? How would you solve it using a reference angle.

Talk with your partner about the two methods.

Be prepared to share with the class.