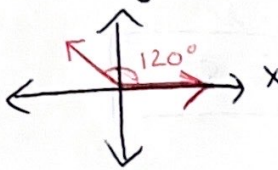
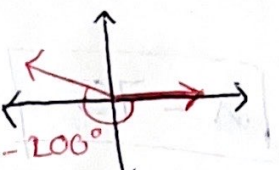
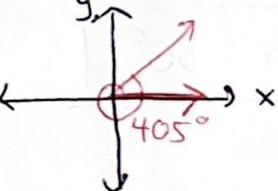
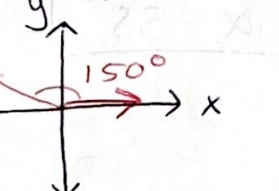


Notes: 32.1 More Angles and Intro to Unit Circle

Angles in Standard Position

- Place initial side on positive x -axis.
- Rotate θ amount (up if positive, down if negative).
- Place terminal side.

Draw the following angles:

<p>1. $\theta = 120^\circ$</p> 	<p>2. $\theta = -200^\circ$</p> 
<p>3. $\theta = \frac{9\pi}{4} \left(\frac{180^\circ}{\pi} \right) = \frac{9(180^\circ)}{4} = 9(45^\circ) = 405^\circ$</p> 	<p>4. $\theta = \frac{5\pi}{6} \left(\frac{180^\circ}{\pi} \right) = \frac{5(180^\circ)}{6} = 5(30^\circ) = 150^\circ$</p> 

Coterminal Angles

- Angles with same initial and terminal side, but different rotations (different θ).
- Add or subtract multiples of 360° or 2π .

Find one positive and one negative angle that are coterminal with the following:

<p>5. $\theta = 245^\circ$</p> <p>$245^\circ + 360^\circ = \boxed{605^\circ}$</p> <p>$245^\circ - 360^\circ = \boxed{-115^\circ}$</p>	<p>6. $\theta = \frac{\pi}{3} \left(\frac{180^\circ}{\pi} \right) = \frac{180^\circ}{3} = 60^\circ$</p> <p>$60^\circ + 360^\circ = \boxed{420^\circ}$</p> <p>$60^\circ - 360^\circ = \boxed{-300^\circ}$</p>
<p>7. $\theta = -270^\circ$</p> <p>$-270^\circ + 360^\circ = \boxed{90^\circ}$</p> <p>$-270^\circ - 360^\circ = \boxed{-630^\circ}$</p>	<p>8. $\theta = \frac{10\pi}{6} \left(\frac{180^\circ}{\pi} \right) = 300^\circ$</p> <p>$300^\circ + 360^\circ = \boxed{660^\circ}$</p> <p>$300^\circ - 360^\circ = \boxed{-60^\circ}$</p>
<p>9. $\theta = -560^\circ$</p> <p>$-560^\circ + 360^\circ = \boxed{-200^\circ} + 360^\circ = \boxed{160^\circ}$</p>	<p>10. $\theta = 480^\circ$</p> <p>$480^\circ + 360^\circ = \boxed{840^\circ}$</p> <p>$480^\circ - 360^\circ = 120^\circ - 360^\circ = \boxed{-240^\circ}$</p>

Reference Angles

less than 90°

- The positive acute angle between the terminal side and the x-axis.
- We use α to represent the reference angle, not θ

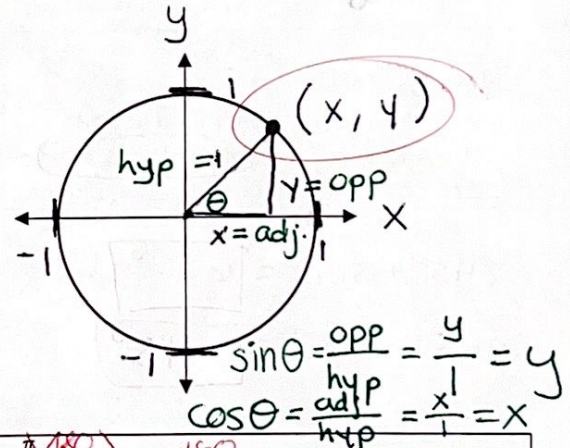
α ~~not~~ ~~not~~ α

Determine the reference angles for the following:

<p>11. $\theta = 245^\circ$</p> <p>$\alpha = 65^\circ$</p>	<p>12. $\theta = \frac{3\pi}{4} \left(\frac{180^\circ}{\pi}\right) = \frac{3(180^\circ)}{4} = 3(45^\circ) = 135^\circ$</p> <p>$\alpha = 45^\circ$</p>
<p>13. $\theta = 435^\circ$</p> <p>$\alpha = 75^\circ$</p>	<p>14. $\theta = \frac{4\pi}{5} \left(\frac{180^\circ}{\pi}\right) = 80^\circ$</p> <p>$\alpha = 80^\circ$</p>
<p>15. $\theta = 325^\circ$</p> <p>$\alpha = 35^\circ$</p>	<p>16. $\theta = \frac{7\pi}{6} \left(\frac{180^\circ}{\pi}\right) = 210^\circ$</p> <p>$\alpha = 30^\circ$</p>

Introduction to Unit Circle

- The Unit Circle is extremely helpful in figuring out trig values. We'll start with easy ones today and move on to more difficult ones the next few days.
- The Unit Circle has a radius of 1.
- On the Unit Circle $x = \cos \theta$.
- On the Unit Circle $y = \sin \theta$.



Find $\sin \theta$ and $\cos \theta$ for the following:

<p>17. $\theta = 90^\circ$</p> <p>$\sin 90^\circ = 1$ $\cos 90^\circ = 0$</p> <p>$(0, 1)$</p>	<p>18. $\theta = -\frac{\pi}{2} \left(\frac{180^\circ}{\pi}\right) = -\frac{180^\circ}{2} = -90^\circ$</p> <p>$\sin(-90^\circ) = -1$ $\cos(-90^\circ) = 0$</p> <p>$(0, -1)$</p>
<p>19. $\theta = 720^\circ$</p> <p>$\sin 720^\circ = 0$ $\cos 720^\circ = 1$</p> <p>$(1, 0)$</p>	<p>20. $\theta = \frac{7\pi}{2} \left(\frac{180^\circ}{\pi}\right) = \frac{7(180^\circ)}{2} = 7(90^\circ) = 630^\circ$</p> <p>$\sin 630^\circ = -1$ $\cos 630^\circ = 0$</p> <p>$(0, -1)$</p>