## Draw an angle with the given measure in standard position.
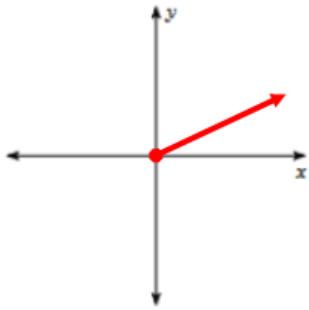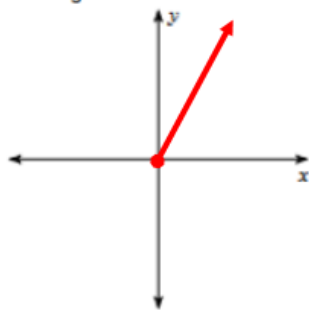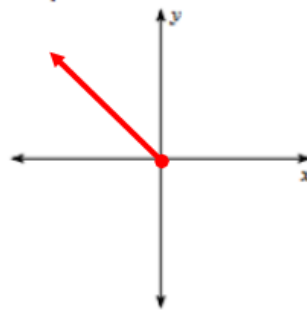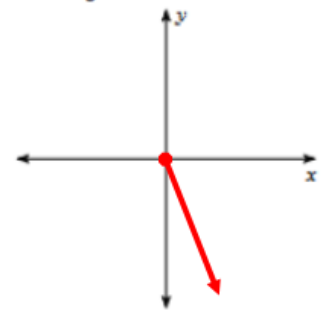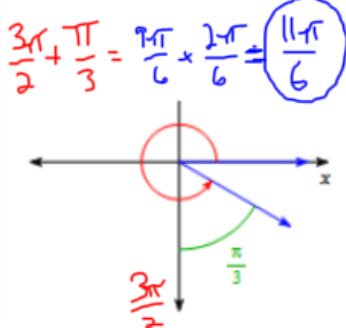
1. $\frac{\pi}{6}$

2. $-\frac{5\pi}{3}$

3. $\frac{3\pi}{4}$

4. $-\frac{12\pi}{5}$

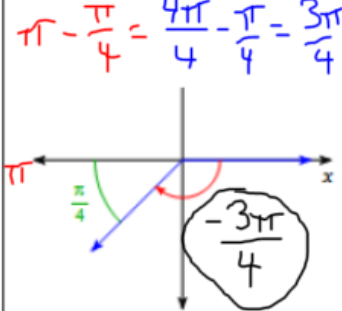## Find the measure of each angle. (IN RADIANS!)

5.

$\frac{3\pi}{2} + \frac{\pi}{3} = \frac{9\pi}{6} + \frac{2\pi}{6} = \boxed{\frac{11\pi}{6}}$

$\frac{3\pi}{2}$    $\frac{\pi}{3}$

6.

$\pi - \frac{\pi}{4} = \frac{4\pi}{4} - \frac{\pi}{4} = \frac{3\pi}{4}$

$\frac{\pi}{4}$    $\boxed{-\frac{3\pi}{4}}$

7.

$\frac{11\pi}{12}$    $\boxed{\frac{-13\pi}{12}}$

$2\pi - \frac{11\pi}{12} = \frac{24\pi}{12} - \frac{11\pi}{12} = \frac{13\pi}{12}$

8. $\frac{\pi}{2} - \frac{5\pi}{18} = \frac{9\pi}{18} - \frac{5\pi}{18} = \frac{4\pi}{18} = \frac{2\pi}{9}$

$\frac{5\pi}{18}$    $\frac{2\pi}{9}$

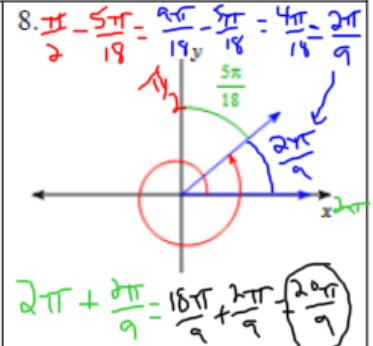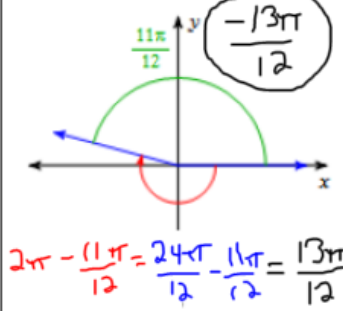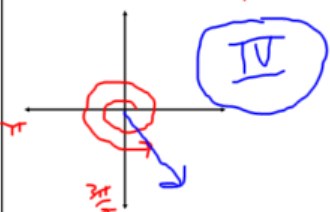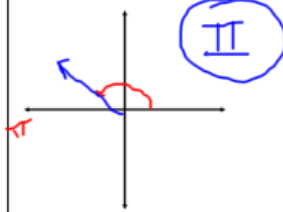$2\pi + \frac{2\pi}{9} = \frac{18\pi}{9} + \frac{2\pi}{9} = \boxed{\frac{20\pi}{9}}$

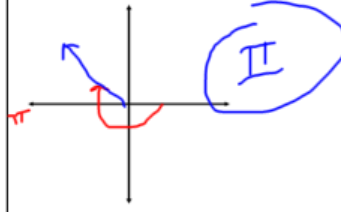## State the quadrant in which the terminal side of each angle lies.

9. $\frac{15\pi}{4} = 3\pi + \frac{3\pi}{4}$

$\boxed{IV}$

$\frac{3\pi}{4}$

10. $\frac{5\pi}{6}$

$\boxed{II}$

11. $-\frac{10\pi}{9} = -1\pi - \frac{\pi}{9}$

$\boxed{II}$

12. $-\frac{17\pi}{6} = -2\pi - \frac{5\pi}{6}$

$\boxed{III}$
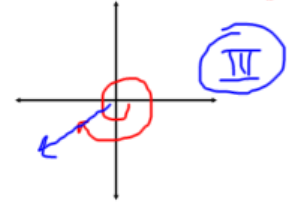
## Find one positive and one negative coterminal angle the angle given. (IN RADIANS!)

13. $\frac{\pi}{3}$

$\frac{\pi}{3} + 2\pi = \frac{\pi}{3} + \frac{6\pi}{3} = \boxed{\frac{7\pi}{3}}$

$\frac{\pi}{3} - 2\pi = \frac{\pi}{3} - \frac{6\pi}{3} = \boxed{\frac{-5\pi}{3}}$

14. $\frac{5\pi}{4}$

$\frac{5\pi}{4} + 2\pi = \frac{5\pi}{4} + \frac{8\pi}{4} = \boxed{\frac{13\pi}{4}}$

$\frac{5\pi}{4} - 2\pi = \frac{5\pi}{4} - \frac{8\pi}{4} = \boxed{\frac{-3\pi}{4}}$

## Find a coterminal angle between 0 and $2\pi$.

15. $\frac{9\pi}{4}$

$\frac{9\pi}{4} - 2\pi = \frac{9\pi}{4} - \frac{8\pi}{4} = \boxed{\frac{\pi}{4}}$

16. $\frac{13\pi}{2}$

$\frac{13\pi}{2} - 2\pi = \frac{13\pi}{2} - \frac{4\pi}{2} = \frac{9\pi}{2} - \frac{4\pi}{2} = \frac{5\pi}{2} - \frac{4\pi}{2} = \boxed{\frac{\pi}{2}}$

**Find ALL coterminal angles in the world for each angle.**

**17.**



$2\pi - \frac{\pi}{4} = \frac{8\pi}{4} - \frac{\pi}{4} = \frac{7\pi}{4}$

$\frac{7\pi}{4} + 2\pi n$

where $n$ is an integer

**18.** $\frac{\pi}{2}$

$\frac{\pi}{2} + 2\pi n$

where $n$ is an integer

**Convert each degree measure into radians.**

**19.** $225°$

$225°\left(\frac{\pi}{180°}\right) = \frac{225\pi}{180} = \boxed{\frac{5\pi}{4}}$

**20.** $280°$

$280°\left(\frac{\pi}{180°}\right) = \frac{280\pi}{180} = \boxed{\frac{14\pi}{9}}$

**21.** $-210°$

$-210°\left(\frac{\pi}{180°}\right) = -\frac{210\pi}{180} = \boxed{-\frac{7\pi}{6}}$

**22.** $-1020°$

$-1020°\left(\frac{\pi}{180°}\right) = \frac{-1020\pi}{180} = \boxed{-\frac{17\pi}{3}}$

**Convert each radian measure into degrees.**

**23.** $-\frac{5\pi}{9}$

$-\frac{5\pi}{9}\left(\frac{180°}{\pi}\right) = -\frac{900°}{9} = \boxed{-100°}$

**24.** $\frac{5\pi}{6}$

$\frac{5\pi}{6}\left(\frac{180°}{\pi}\right) = \frac{900°}{6} = \boxed{150°}$

**25.** $\frac{23\pi}{36}$

$\frac{23\pi}{36}\left(\frac{180°}{\pi}\right) = \frac{4140°}{36} = \boxed{115°}$

**26.** $\frac{79\pi}{18}$

$\frac{79\pi}{18}\left(\frac{180°}{\pi}\right) = \frac{14220°}{18} = \boxed{790°}$

## Skillz Review  Simplify the following.

**1.** $\dfrac{\frac{1}{2}}{\frac{3}{2}}$

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

**2.** $\dfrac{\frac{1}{2}}{\frac{\sqrt{3}}{2}}$

$\frac{1}{2} \cdot \frac{2}{\sqrt{3}} = \frac{2}{2\sqrt{3}} = \frac{1}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \boxed{\frac{\sqrt{3}}{3}}$

**3.** $\dfrac{3}{\left(\frac{\sqrt{2}}{2}\right)}$

$3 \cdot \frac{2}{\sqrt{2}} = \frac{6}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{6\sqrt{2}}{2} = \boxed{3\sqrt{2}}$

**4.** $\dfrac{\left(\frac{\sqrt{3}}{2}\right)}{\sqrt{3}}$

$\frac{\sqrt{3}}{2} \cdot \frac{1}{\sqrt{3}} = \frac{\sqrt{3} \cdot \sqrt{3}}{2\sqrt{3} \cdot \sqrt{3}} = \frac{3}{6} = \boxed{\frac{1}{2}}$