

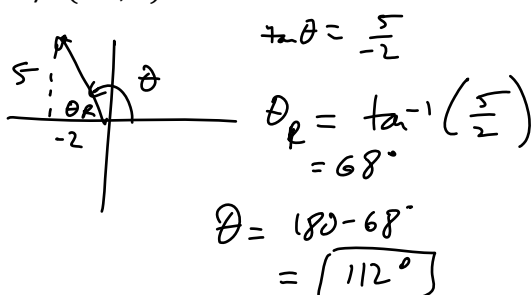
Unit 6: Standard Position Trigonometry

6.5 Solving Trigonometric Equations II

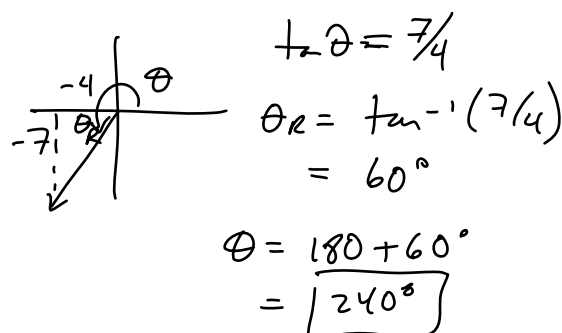
Solving specific angles:

ex. Solve to the nearest degree, $0 \leq \theta < 360^\circ$, if θ is an angle in standard position with a terminal arm point:

a) $(-2, 5)$



b) $(-4, -7)$



Trig equations involving squares:

ex. Solve to the nearest degree, $0 \leq \theta < 360^\circ$:

a) $\sqrt{\tan^2 \theta} = \sqrt{\frac{1}{9}}$ all quadrants

$\tan \theta = \pm \frac{1}{3}$
 $\theta_R = \tan^{-1}\left(\frac{1}{3}\right) = 18^\circ$
 $\theta = 18^\circ, 162^\circ, 198^\circ, 342^\circ$

b) $5\sin^2 \theta - 1 = 3$

$\sqrt{\sin^2 \theta} = \sqrt{\frac{4}{5}}$
 $\sin \theta = \pm \frac{2}{\sqrt{5}}$
 $\theta_R = \sin^{-1}\left(\frac{2}{\sqrt{5}}\right) = 63^\circ$
 $\theta = 63^\circ, 117^\circ, 243^\circ, 297^\circ$

Solving equations with special or quadrantal angles:

ex. Solve without a calculator, $0 \leq \theta < 360^\circ$:

a) $\sin \theta = \frac{1}{2}$

$\theta_R = 30^\circ$
 $\theta = 30^\circ, 150^\circ$

b) $\cos \theta = -\frac{1}{\sqrt{2}}$

$\theta_R = 45^\circ$
 $\theta = 135^\circ, 225^\circ$

c) $\cos \theta = 0$

$\frac{x}{r} = 0$
 unit circle $r = 1$
 $x = 0$
 Points: $(0, 1)$ and $(0, -1)$
 $\theta = 90^\circ, 270^\circ$

d) $\sin \theta = -1$

$\frac{y}{r} = -1$
 $y = -1$
 Point: $(0, -1)$
 $\theta = 270^\circ$