

## 4.7 Inverse Trigonometric Functions Worksheet-Day 1

What are the domain values for the following inverse functions?

$y = \sin^{-1} x$ <sup>inputs</sup> $[-1, 1]$	$y = \cos^{-1} x$ $[-1, 1]$	$y = \tan^{-1} x$ $(-\infty, \infty)$
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What are the range values for the following inverse functions?

$y = \sin^{-1} x$ <sup>outputs</sup> $[-\frac{\pi}{2}, \frac{\pi}{2}]$	$y = \cos^{-1} x$ $[0, \pi]$	$y = \tan^{-1} x$ $(-\frac{\pi}{2}, \frac{\pi}{2})$
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Find the exact value in radian measure without using a calculator.

1. $\sin^{-1} \frac{1}{2} = \frac{\pi}{6}$ (Rad)	2. $\arcsin 0 = 0$ (Rad)	3. $\arccos \frac{1}{2} = \frac{\pi}{3}$
4. $\arccos 5$ is undefined	5. $\sin^{-1} 1 = \frac{\pi}{2}$	6. $\arccos 1 = 0$ (Rad)
7. $\arctan 1 = \frac{\pi}{4}$	8. $\tan^{-1} 0 = 0$	9. $\arctan \frac{\sqrt{3}}{3} = \frac{\pi}{6}$
10. $\arctan(-1) = -\frac{\pi}{4}$	11. $\cos^{-1} \left( -\frac{\sqrt{2}}{2} \right) = \frac{3\pi}{4}$	12. $\sin^{-1} \left( -\frac{\sqrt{2}}{2} \right) = -\frac{\pi}{4}$
13. $\arctan(-\sqrt{3}) = -\frac{\pi}{3}$	14. $\arctan \sqrt{3} = \frac{\pi}{3}$	15. $\sin^{-1}(-4)$ is undefined

### 4.7 Inverse Trigonometric Functions Worksheet-Day 2

What are the domain values for the following inverse functions?

$y = \sin^{-1} x$ <u><math>[-1, 1]</math></u>	$y = \cos^{-1} x$ <u><math>[-1, 1]</math></u>	$y = \tan^{-1} x$ <u><math>(-\infty, \infty)</math></u>
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What are the range values for the following inverse functions?

$y = \sin^{-1} x$ <u><math>[-\pi/2, \pi/2]</math></u>	$y = \cos^{-1} x$ <u><math>[0, \pi]</math></u>	$y = \tan^{-1} x$ <u><math>(-\pi/2, \pi/2)</math></u>
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Use the properties of inverse functions to find the exact value of the expression. No Calculator!

<p>1. <math>\cos^{-1}\left(-\frac{1}{2}\right)</math> <u><math>2\pi/3</math></u></p> <p>At what <math>\Delta</math> is <math>\cos \theta = -1/2</math>?</p>	<p>2. <math>\arcsin\left(-\frac{\sqrt{3}}{2}\right)</math> <u><math>-\pi/3</math></u></p> <p>At what <math>\Delta</math> is <math>\sin \theta = -\sqrt{3}/2</math>?</p>	<p>3. <math>\arcsin\frac{\sqrt{3}}{2}</math> <u><math>\pi/3</math></u></p> <p>At what <math>\Delta</math> is <math>\sin \theta = \sqrt{3}/2</math>?</p>
<p>4. <math>\sin(\arcsin 0.7)</math></p> <p><u><math>0.7</math></u></p>	<p>5. <math>\cos[\cos^{-1}(-0.3)]</math></p> <p><u><math>-0.3</math></u></p>	<p>6. <math>\arcsin(\sin 3\pi)</math></p> <p><math>\sin 3\pi = 0</math></p> <p><del><math>3\pi</math></del></p> <p><math>\arcsin(0) =</math> <u><math>0</math></u></p>
<p>7. <math>\tan^{-1}\left(\tan \frac{11\pi}{6}\right)</math></p> <p><math>\tan(11\pi/6) = -\sqrt{3}/3</math></p> <p><math>\tan^{-1}(-\sqrt{3}/3) =</math> <u><math>-\pi/6</math></u></p>	<p>8. <math>\sin^{-1}\left(\sin \frac{5\pi}{2}\right)</math></p> <p><math>\sin(5\pi/2) = 1</math></p> <p><math>\sin^{-1}(1) =</math> <u><math>\pi/2</math></u></p>	<p>9. <math>\sin^{-1}\left(\tan \frac{5\pi}{4}\right)</math></p> <p><math>\tan(5\pi/4) = 1</math></p> <p><math>\sin^{-1}(1) =</math> <u><math>\pi/2</math></u></p>
<p>10. <math>\tan(\arcsin 0)</math></p> <p><math>\arcsin 0 = 0</math></p> <p><math>\tan(0) =</math> <u><math>0</math></u></p>	<p>11. <math>\sin(\arctan 1)</math></p> <p><math>\arctan 1 = \pi/4</math></p> <p><math>\sin(\pi/4) =</math> <u><math>\frac{\sqrt{2}}{2}</math></u></p>	<p>12. <math>\sin^{-1}\left(\cos\left(-\frac{\pi}{6}\right)\right)</math></p> <p><math>\cos(-\pi/6) = \sqrt{3}/2</math></p> <p><math>\sin^{-1}(\sqrt{3}/2) =</math> <u><math>\pi/3</math></u></p>
<p>13. <math>\tan\left(\sin^{-1}\frac{\sqrt{2}}{2}\right) - \cot\left(\arccos\frac{\sqrt{2}}{2}\right)</math></p> <p><math>\sin^{-1} \sqrt{2}/2 = \pi/4</math>      <math>\arccos \frac{\sqrt{2}}{2} = \pi/4</math></p> <p><math>\tan(\pi/4) = 1</math>      <math>\cot \pi/4 = 1</math></p> <p><math>1 - 1 =</math> <u><math>0</math></u></p>		