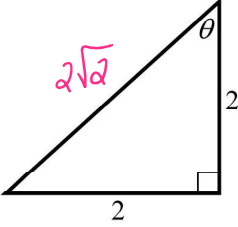
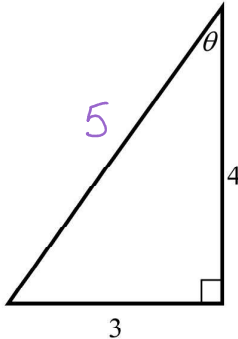


Name Answer Key
 Calculus I Honors - Trigonometry Review

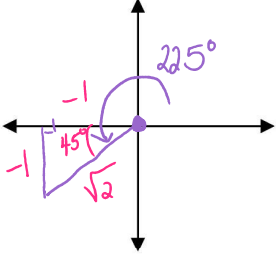
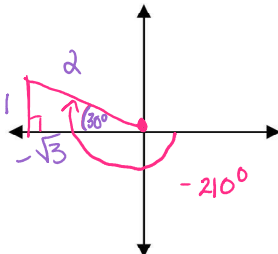
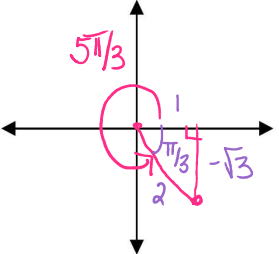
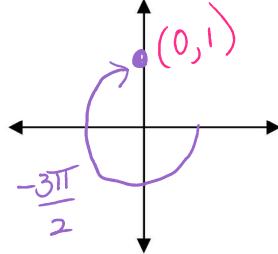
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YOU MUST SHOW ALL REQUIRED WORK TO RECEIVE CREDIT.

Find the exact values of all six trigonometric functions of θ . You must show some work.

<p>1.</p> $2^2 + 2^2 = c^2$ $8 = c^2$ $c = 2\sqrt{2}$  $\sin \theta = \frac{2}{2\sqrt{2}} = \frac{1}{\sqrt{2}}$ $\cos \theta = \frac{2}{2\sqrt{2}} = \frac{1}{\sqrt{2}}$ $\tan \theta = \frac{2}{2} = 1$ $\csc \theta = \frac{\sqrt{2}}{1}$ $\sec \theta = \frac{\sqrt{2}}{1}$ $\cot \theta = 1$	<p>2.</p> $3^2 + 4^2 = c^2$ $c = 5$  $\sin \theta = \frac{4}{5}$ $\cos \theta = \frac{3}{5}$ $\tan \theta = \frac{4}{3}$ $\csc \theta = \frac{5}{4}$ $\sec \theta = \frac{5}{3}$ $\cot \theta = \frac{3}{4}$
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Find the values of all six trigonometric functions of θ without using a calculator. You must show some work (diagrams encouraged!).

<p>3. 225°</p> $\sin \theta = \frac{-1}{\sqrt{2}}$ $\cos \theta = \frac{-1}{\sqrt{2}}$ $\tan \theta = 1$ $\csc \theta = -\sqrt{2}$ $\sec \theta = -\sqrt{2}$ $\cot \theta = 1$ 	<p>4. -210°</p> $\sin \theta = \frac{1}{2}$ $\cos \theta = \frac{-\sqrt{3}}{2}$ $\tan \theta = \frac{-1}{\sqrt{3}}$ $\csc \theta = 2$ $\sec \theta = \frac{2}{-\sqrt{3}}$ $\cot \theta = -\sqrt{3}$ 
<p>5. $\frac{5\pi}{3}$</p> $\sin \theta = \frac{-\sqrt{3}}{2}$ $\cos \theta = \frac{1}{2}$ $\tan \theta = \frac{-\sqrt{3}}{1}$ $\csc \theta = \frac{-2}{\sqrt{3}}$ $\sec \theta = 2$ $\cot \theta = \frac{-1}{\sqrt{3}}$ 	<p>6. $\frac{3\pi}{2}$</p> $\sin \theta = -1$ $\cos \theta = 0$ $\tan \theta = \text{und}$ $\csc \theta = -1$ $\sec \theta = \text{und}$ $\cot \theta = 0$ 

Find all values of θ (in radians) that satisfy the given equation. **Do not use a calculator.**
Show your work (diagrams encouraged)!

7. $\cos \theta = -\frac{1}{\sqrt{2}}$

$\theta = \frac{3\pi}{4} + 2\pi n$
 $\theta = \frac{5\pi}{4} + 2\pi n, n \text{ is integer}$

8. $3 \tan^2 \theta - 1 = 0$

$\tan^2 \theta = \frac{1}{3}$
 $\tan \theta = \pm \frac{1}{\sqrt{3}}$
 $\theta = \frac{\pi}{6} + \pi n$
 $\theta = \frac{5\pi}{6} + \pi n$
 $\theta = \frac{\pi}{6} + \frac{\pi}{2}n, n \text{ is integer}$

9. $\sin \theta = -1$

$\theta = \frac{3\pi}{2} + 2\pi n, n \text{ is integer}$

10. $\sec \theta = 2$

$\cos \theta = \frac{1}{2}$
 $\theta = \frac{\pi}{3} + 2\pi n$
 $\theta = \frac{5\pi}{3} + 2\pi n, n \text{ is integer}$

Find all values of θ (in radians) in the interval $[0, 2\pi)$. Show your work (diagrams encouraged)!

11. $\sin \theta = 0$

$\theta = 0 + \pi n, n \text{ is integer}$

$\theta = 0, \pi$

12. $2 \cos \theta + 1 = 0$

$\cos \theta = -\frac{1}{2}$
 $\theta = \frac{2\pi}{3} + 2\pi n, \frac{4\pi}{3} + 2\pi n, n \text{ is integer}$

$\theta = \frac{2\pi}{3}, \frac{4\pi}{3}$

13. $\tan \theta = 1$

$\theta = \frac{\pi}{4} + \pi n, n \text{ is int.}$

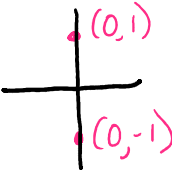
$\theta = \frac{\pi}{4}, \frac{5\pi}{4}$

14. $\csc \theta$ is undefined = $\frac{1}{0}$

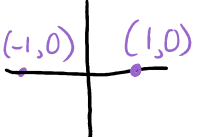
$\sin \theta = \frac{0}{1}$
 $\theta = 0 + \pi n, n \text{ is integer}$

$\theta = 0, \pi$

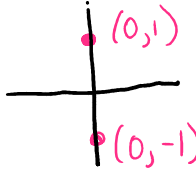
15. $\sec \theta$ is undefined $= \frac{1}{0}$
 $\cos \theta = 0$
 $\theta = \frac{\pi}{2} + \pi n, n \text{ is int.}$
 $\theta = \frac{\pi}{2}, \frac{3\pi}{2}$



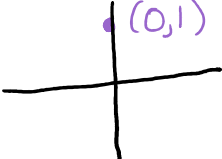
16. $\cot \theta$ is undefined $= \frac{\pm 1}{0}$
 $\frac{\cos \theta}{\sin \theta} = \frac{\pm 1}{0} \Rightarrow \sin \theta = 0$
 $\theta = 0 + \pi n, n \text{ is int.}$
 $\theta = 0, \pi$



17. $\sin^2 \theta = 1$
 $\sin \theta = \pm 1$
 $\theta = \frac{\pi}{2} + \pi n$
 $\theta = \frac{\pi}{2}, \frac{3\pi}{2}$

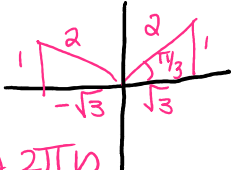


18. $\sin \theta^2 = 1$
 $\theta^2 = \frac{\pi}{2} + \pi n$
 $\theta = \sqrt{\frac{\pi}{2} + 2\pi n}$
 $\theta = \sqrt{\frac{\pi}{2}}, \sqrt{\frac{5\pi}{2}}, \sqrt{\frac{9\pi}{2}}, \sqrt{\frac{13\pi}{2}}, \sqrt{\frac{17\pi}{2}}, \sqrt{\frac{21\pi}{2}}, \sqrt{\frac{25\pi}{2}}$

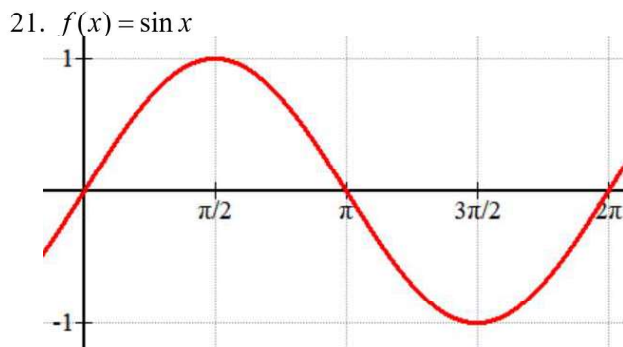


19. $\sin(2\theta) = 1$
 $\frac{2\theta}{2} = \frac{\pi}{2} + \frac{2\pi n}{2}$
 $\theta = \frac{\pi}{4} + \pi n$
 $\theta = \frac{\pi}{4}, \frac{5\pi}{4}$

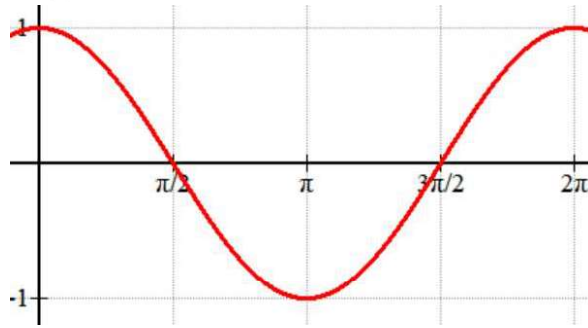
20. $2\sin \theta = 1$
 $\sin \theta = \frac{1}{2}$
 $\theta = \frac{\pi}{6} + 2\pi n, \frac{5\pi}{6} + 2\pi n$
 $\theta = \frac{\pi}{6}, \frac{5\pi}{6}$



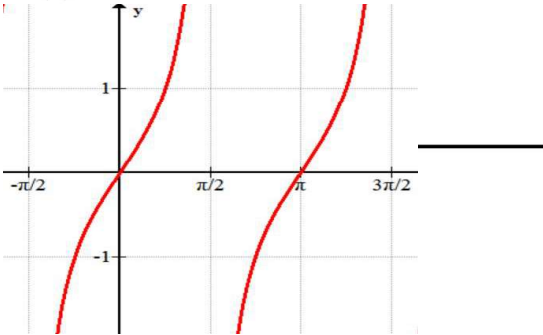
Sketch one period of each trig function below.



22. $g(x) = \cos x$



23. $h(x) = \tan x$



Rewrite in terms of $\sin x$, $\cos x$ and $\tan x$.

$$24. h(x) = \frac{\sin x \sec^2 x}{\csc x} = \frac{\sin(x) \cdot \frac{1}{\cos^2 x}}{\frac{1}{\sin x}}$$

$$h(x) = \frac{\sin(x)}{\cos^2 x} \cdot \frac{\sin x}{1} = \frac{\sin^2 x}{\cos^2 x}$$

$$h(x) = \left(\frac{\sin x}{\cos x}\right)^2 = \tan^2 x$$

25. $p(x) = \sin^2 x \cot x \csc x$

$$p(x) = \cancel{\sin^2 x} \cdot \frac{\cos x}{\cancel{\sin x}} \cdot \frac{1}{\cancel{\sin x}}$$

$$p(x) = \cos x$$

26. $q(x) = \frac{\cos^2 x (1 + \sin x)}{(1 - \sin x)(1 + \sin x)}$

$$q(x) = \frac{\cos^2 x (1 + \sin x)}{1 - \sin^2 x}$$

$$q(x) = \frac{\cancel{\cos^2 x} (1 + \sin x)}{\cancel{\cos^2 x}}$$

$$q(x) = 1 + \sin x$$

27. $s(x) = \frac{\sin(2x)}{\tan x}$

$$s(x) = \frac{2 \sin x \cos x}{\frac{\sin x}{\cos x}}$$

$$s(x) = 2 \cancel{\sin x} \cos x \cdot \frac{\cos x}{\cancel{\sin x}}$$

$$s(x) = 2 \cos^2 x$$