

MCR3U1

Related Angles

1. For each of the following state the related acute angle and the sign of the function.

- a) $\cos 141^\circ$
- b) $\tan 191^\circ$
- c) $\csc 320^\circ$
- d) $\sec 338^\circ$
- e) $\cot 220^\circ$
- f) $\sin -142^\circ$
- g) $\cot 342^\circ$
- h) $\csc 201^\circ$
- i) $\sec -216^\circ$

2. Find two angles between 0° and 360° that have each trigonometric function value. Write the angles to the nearest degree.

- a) $\sin \theta = 0.3425$
- b) $\sin \theta = -0.4950$
- c) $\tan \theta = 2.7300$
- d) $\cot \theta = -3.3655$
- e) $\sec \theta = -1.3462$
- f) $\csc \theta = 1.9954$

CAST rule

1. $\angle \theta$ is an angle in standard position and $0^\circ \leq \theta \leq 360^\circ$. A trig ratio is given. Find the exact values of the other 5 trig. ratios.

- a) $\sin \theta = \frac{1}{\sqrt{2}}$
- b) $\sec \theta = \frac{13}{5}$
- c) $\tan \theta = \frac{2}{1}$
- d) $\cos \theta = \frac{\sqrt{3}}{2}$
- e) $\csc \theta = -\frac{6}{5}$
- f) $\cot \theta = -\frac{5}{8}$

$\frac{2}{\sqrt{5}}$	$\frac{5}{\sqrt{13}}$	$\frac{2}{\sqrt{13}}$	$\frac{1}{\sqrt{2}}$	$\frac{5}{13}$	$\frac{2}{1}$	$\frac{1}{\sqrt{2}}$	$\frac{5}{6}$	$\frac{5}{8}$
$\frac{2}{\sqrt{5}}$	$\frac{5}{\sqrt{13}}$	$\frac{2}{\sqrt{13}}$	$\frac{1}{\sqrt{2}}$	$\frac{5}{13}$	$\frac{2}{1}$	$\frac{1}{\sqrt{2}}$	$\frac{5}{6}$	$\frac{5}{8}$
$\frac{2}{\sqrt{5}}$	$\frac{5}{\sqrt{13}}$	$\frac{2}{\sqrt{13}}$	$\frac{1}{\sqrt{2}}$	$\frac{5}{13}$	$\frac{2}{1}$	$\frac{1}{\sqrt{2}}$	$\frac{5}{6}$	$\frac{5}{8}$
$\frac{2}{\sqrt{5}}$	$\frac{5}{\sqrt{13}}$	$\frac{2}{\sqrt{13}}$	$\frac{1}{\sqrt{2}}$	$\frac{5}{13}$	$\frac{2}{1}$	$\frac{1}{\sqrt{2}}$	$\frac{5}{6}$	$\frac{5}{8}$
$\frac{2}{\sqrt{5}}$	$\frac{5}{\sqrt{13}}$	$\frac{2}{\sqrt{13}}$	$\frac{1}{\sqrt{2}}$	$\frac{5}{13}$	$\frac{2}{1}$	$\frac{1}{\sqrt{2}}$	$\frac{5}{6}$	$\frac{5}{8}$
$\frac{2}{\sqrt{5}}$	$\frac{5}{\sqrt{13}}$	$\frac{2}{\sqrt{13}}$	$\frac{1}{\sqrt{2}}$	$\frac{5}{13}$	$\frac{2}{1}$	$\frac{1}{\sqrt{2}}$	$\frac{5}{6}$	$\frac{5}{8}$
$\frac{2}{\sqrt{5}}$	$\frac{5}{\sqrt{13}}$	$\frac{2}{\sqrt{13}}$	$\frac{1}{\sqrt{2}}$	$\frac{5}{13}$	$\frac{2}{1}$	$\frac{1}{\sqrt{2}}$	$\frac{5}{6}$	$\frac{5}{8}$
$\frac{2}{\sqrt{5}}$	$\frac{5}{\sqrt{13}}$	$\frac{2}{\sqrt{13}}$	$\frac{1}{\sqrt{2}}$	$\frac{5}{13}$	$\frac{2}{1}$	$\frac{1}{\sqrt{2}}$	$\frac{5}{6}$	$\frac{5}{8}$
$\frac{2}{\sqrt{5}}$	$\frac{5}{\sqrt{13}}$	$\frac{2}{\sqrt{13}}$	$\frac{1}{\sqrt{2}}$	$\frac{5}{13}$	$\frac{2}{1}$	$\frac{1}{\sqrt{2}}$	$\frac{5}{6}$	$\frac{5}{8}$
$\frac{2}{\sqrt{5}}$	$\frac{5}{\sqrt{13}}$	$\frac{2}{\sqrt{13}}$	$\frac{1}{\sqrt{2}}$	$\frac{5}{13}$	$\frac{2}{1}$	$\frac{1}{\sqrt{2}}$	$\frac{5}{6}$	$\frac{5}{8}$

Answers: (a) -40° (b) 11° (c) 40° (d) 220° (e) 280°
 (f) 38° (g) 18° (h) 210° (i) 36°
 2(a) $20^\circ, 160^\circ$ (b) $210^\circ, 330^\circ$ (c) $70^\circ, 250^\circ$ (d) $163^\circ, 343^\circ$ (e) $138^\circ, 222^\circ$
 (f) $30^\circ, 210^\circ$

Related Angles

1. Determine an angle between 90° and 180° that has each trigonometric function value. Write the angle to the nearest degree.

- a) $\sin \theta = 0.42$ b) $\tan \theta = -0.35$ c) $\cos \theta = -0.58$
 d) $\tan \theta = -1.25$ e) $\cos \theta = -0.45$ f) $\sin \theta = 0.75$

2. Determine an angle between 180° and 270° that has each trigonometric function value. Write the angle to the nearest degree.

- a) $\cos \theta = -0.82$ b) $\tan \theta = 2.21$ c) $\sin \theta = -0.57$
 d) $\tan \theta = 0.66$ e) $\cos \theta = -0.21$ f) $\sin \theta = -0.45$

3. Determine an angle between 270° and 360° that has each trigonometric function value. Write the angle to the nearest degree.

- a) $\tan \theta = -0.83$ b) $\cos \theta = 0.74$ c) $\sin \theta = -0.19$
 d) $\tan \theta = -4.75$ e) $\sin \theta = -0.69$ f) $\cos \theta = 0.35$

4. Determine two angles between 0° and 360° that have each trigonometric function value. Write the angles to the nearest degree.

- a) $\cos \theta = 0.42$ b) $\sin \theta = 0.29$ c) $\tan \theta = 1.37$
 d) $\sin \theta = 0.82$ e) $\cos \theta = 0.73$ f) $\tan \theta = 2.48$

5. Determine two angles between 0° and 360° that have each trigonometric function value. Write the angles to the nearest degree.

- a) $\sin \theta = -0.47$ b) $\tan \theta = -0.92$ c) $\cos \theta = -0.91$
 d) $\sin \theta = -0.85$ e) $\cos \theta = -0.29$ f) $\tan \theta = -5.7$

Answers (2)

1 a) 155° b) 161° c) 125° d) 129° e) 151° f) 131°
 2 a) 220° b) 246° c) 215° d) 213° e) 258° f) 207°
 3 a) 320° b) 318° c) 349° d) 282° e) 316° f) 290°
 4 a) $65^\circ, 295^\circ$ b) $17^\circ, 163^\circ$ c) $54^\circ, 234^\circ$ d) $55^\circ, 125^\circ$ e) $43^\circ, 317^\circ$ f) $68^\circ, 248^\circ$
 5 a) $208^\circ, 332^\circ$ b) $176^\circ, 317^\circ$ c) $156^\circ, 204^\circ$ d) $238^\circ, 302^\circ$ e) $107^\circ, 253^\circ$ f) $100^\circ, 250^\circ$
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