



Solve trigonometric equations over specified intervals

1

Which trig ratios and signs would be correct for this angle?

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

A

sec $\rightarrow$ positive
sin $\rightarrow$ negative

B

sec $\rightarrow$ negative
sin $\rightarrow$ negative

2Solve the trigonometric equation for x in the given domain.

$$\frac{\cos(x)}{\sin(x)} = \sqrt{3}$$
$$\text{for } 0 \leq x < 2\pi$$

$$\text{using } \cot(x) = \frac{\cos(x)}{\sin(x)}$$

A

$$x = \frac{5\pi}{6} \text{ or } x = \frac{11\pi}{6}$$

B

$$x = \frac{\pi}{6}$$

C

$$x = \frac{\pi}{6} \text{ or } x = \frac{2\pi}{3} \text{ or } x = \frac{7\pi}{6}$$

D

$$x = \frac{\pi}{6} \text{ or } x = \frac{7\pi}{6}$$



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3

Solve the trigonometric equation for x in the given domain.

$$1 - \sin^2(x) = \frac{3}{4}$$

$$\text{for } 0 \leq x < 2\pi$$

$$\text{using } \sin^2(x) + \cos^2(x) = 1$$

A

$$x = \frac{\pi}{6} \text{ or } x = \frac{5\pi}{6} \text{ or } x = \frac{7\pi}{6}$$

B

$$x = \frac{\pi}{6}$$

C

$$x = \frac{\pi}{6} \text{ or } x = \frac{2\pi}{3} \text{ or } x = \frac{5\pi}{6} \text{ or } x = \frac{7\pi}{6} \text{ or } x = \frac{11\pi}{6}$$

D

$$x = \frac{\pi}{6} \text{ or } x = \frac{5\pi}{6} \text{ or } x = \frac{7\pi}{6} \text{ or } x = \frac{11\pi}{6}$$

4

Solve the trigonometric equation for x in the given domain.

$$2 \left(\cos(x) \cos\left(\frac{\pi}{3}\right) - \sin(x) \sin\left(\frac{\pi}{3}\right) \right) = \sqrt{2}$$

$$\text{for } 0 \leq x < 2\pi$$

$$\text{using } \cos(A + B) = \cos A \cos B - \sin A \sin B$$

A

$$x = \frac{\pi}{12} \text{ or } x = \frac{7\pi}{12}$$

B

$$x = \frac{17\pi}{12} \text{ or } x = \frac{23\pi}{12}$$

C

$$x = \frac{17\pi}{12}$$

D

$$x = \frac{5\pi}{12} \text{ or } x = \frac{11\pi}{12}$$

5

Solve the trigonometric equation for x in the given domain.

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

$$\text{for } 0 \leq x < 2\pi$$

A

$$x = \frac{\pi}{4} \text{ or } x = \frac{3\pi}{4} \text{ or } x = \frac{5\pi}{4} \text{ or } x = \frac{7\pi}{4}$$

B

$$x = \frac{\pi}{4} \text{ or } x = \frac{3\pi}{4} \text{ or } x = \frac{5\pi}{4}$$

C

$$x = \frac{\pi}{4}$$



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6Solve the trigonometric equation for x in the given domain.

$$3(2 \sin(x) \cos(x)) = -3$$
$$\text{for } 0 \leq x < 2\pi$$

$$\text{using } \sin(2x) = 2 \sin x \cos x$$

A

$$x = \frac{3\pi}{4} \text{ or } x = \frac{5\pi}{4} \text{ or } x = \frac{7\pi}{4}$$

B

$$x = \frac{\pi}{4} \text{ or } x = \frac{5\pi}{4}$$

C

$$x = \frac{3\pi}{4} \text{ or } x = \frac{7\pi}{4}$$

D

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

7Solve the trigonometric equation for x in the given domain.

$$\sec(x) = \sqrt{2}$$
$$\text{for } 0 \leq x < 2\pi$$

A

$$x = \frac{\pi}{4} \text{ or } x = \frac{7\pi}{4}$$

B

$$x = \frac{\pi}{4} \text{ or } x = \frac{3\pi}{4} \text{ or } x = \frac{7\pi}{4}$$

C

$$x = \frac{3\pi}{4} \text{ or } x = \frac{5\pi}{4}$$

D

$$x = \frac{\pi}{4}$$



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8Solve the trigonometric equation for x in the given domain.

$$\cos(2x) = \frac{1}{2}$$
$$\text{for } 0 \leq x < 2\pi$$

$$\text{using } \cos(2x) = \cos^2 x - \sin^2 x$$

A

$$x = \frac{\pi}{6}$$

B

$$x = \frac{\pi}{6} \text{ or } x = \frac{5\pi}{6} \text{ or } x = \frac{7\pi}{6}$$

C

$$x = \frac{\pi}{6} \text{ or } x = \frac{2\pi}{3} \text{ or } x = \frac{5\pi}{6} \text{ or } x = \frac{7\pi}{6} \text{ or } x = \frac{11\pi}{6}$$

D

$$x = \frac{\pi}{6} \text{ or } x = \frac{5\pi}{6} \text{ or } x = \frac{7\pi}{6} \text{ or } x = \frac{11\pi}{6}$$

9Solve the trigonometric equation for x in the given domain.

$$2 \left(\sin(x) \cos\left(\frac{\pi}{3}\right) + \cos(x) \sin\left(\frac{\pi}{3}\right) \right) = -\sqrt{3}$$
$$\text{for } 0 \leq x < 2\pi$$

A

$$x = \pi$$

B

$$x = 0 \text{ or } x = \frac{\pi}{3}$$

C

$$x = \frac{2\pi}{3} \text{ or } x = \pi$$

D

$$x = \pi \text{ or } x = \frac{4\pi}{3}$$

10Solve the trigonometric equation for x in the given domain.

$$\sin(x) \cos\left(\frac{\pi}{3}\right) + \cos(x) \sin\left(\frac{\pi}{3}\right) = -\frac{\sqrt{2}}{2}$$
$$\text{for } 0 \leq x < 2\pi$$

A

$$x = \frac{11\pi}{12}$$

B

$$x = \frac{7\pi}{12} \text{ or } x = \frac{13\pi}{12}$$

C

$$x = \frac{5\pi}{12} \text{ or } x = \frac{23\pi}{12}$$

D

$$x = \frac{11\pi}{12} \text{ or } x = \frac{17\pi}{12}$$



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**11**Solve the trigonometric equation for x in the given domain.

$$2(2 \sin(x) \cos(x)) = -1$$
$$\text{for } 0 \leq x < 2\pi$$

A

$$x = \frac{\pi}{12} \text{ or } x = \frac{5\pi}{12} \text{ or } x = \frac{13\pi}{12} \text{ or } x = \frac{17\pi}{12}$$

B

$$x = \frac{7\pi}{12} \text{ or } x = \frac{11\pi}{12} \text{ or } x = \frac{19\pi}{12}$$

C

$$x = \frac{7\pi}{12}$$

D

$$x = \frac{7\pi}{12} \text{ or } x = \frac{11\pi}{12} \text{ or } x = \frac{19\pi}{12} \text{ or } x = \frac{23\pi}{12}$$

12Solve the trigonometric equation for x in the given domain.

$$\frac{\sin(x)}{\cos(x)} = -\sqrt{3}$$
$$\text{for } 0 \leq x < 2\pi$$

A

$$x = \frac{2\pi}{3} \text{ or } x = \frac{7\pi}{6} \text{ or } x = \frac{5\pi}{3}$$

B

$$x = \frac{\pi}{3} \text{ or } x = \frac{4\pi}{3}$$

C

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

D

$$x = \frac{2\pi}{3} \text{ or } x = \frac{5\pi}{3}$$



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13

Solve the trigonometric equation for x in the given domain.

$$\cos(x) \cos\left(\frac{\pi}{3}\right) - \sin(x) \sin\left(\frac{\pi}{3}\right) = \frac{\sqrt{2}}{2}$$

for $0 \leq x < 2\pi$

using $\cos(A + B) = \cos A \cos B - \sin A \sin B$

A

$$x = \frac{5\pi}{12} \text{ or } x = \frac{11\pi}{12}$$

B

$$x = \frac{\pi}{12} \text{ or } x = \frac{7\pi}{12}$$

C

$$x = \frac{17\pi}{12}$$

D

$$x = \frac{17\pi}{12} \text{ or } x = \frac{23\pi}{12}$$

14

Solve the trigonometric equation for x in the given domain.

$$2(1 - \sin^2(x)) = 1$$

for $0 \leq x < 2\pi$

using $\sin^2(x) + \cos^2(x) = 1$

A

$$x = \frac{\pi}{4}$$

B

$$x = \frac{\pi}{4} \text{ or } x = \frac{3\pi}{4} \text{ or } x = \frac{5\pi}{4}$$

C

$$x = \frac{\pi}{4} \text{ or } x = \frac{3\pi}{4} \text{ or } x = \frac{5\pi}{4} \text{ or } x = \frac{7\pi}{4}$$

15

Solve the trigonometric equation for x in the given domain.

$$\frac{\tan(x) + \tan\left(\frac{\pi}{3}\right)}{1 - \tan(x) \tan\left(\frac{\pi}{3}\right)} = 1$$

for $0 \leq x < 2\pi$

using $\tan(A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$

A

$$x = \frac{11\pi}{12} \text{ or } x = \frac{17\pi}{12} \text{ or } x = \frac{23\pi}{12}$$

B

$$x = \frac{11\pi}{12}$$

C

$$x = \frac{\pi}{12} \text{ or } x = \frac{13\pi}{12}$$

D

$$x = \frac{11\pi}{12} \text{ or } x = \frac{23\pi}{12}$$

**Solve trigonometric equations over specified intervals****16**Solve the trigonometric equation for x in the given domain.

$$\frac{\cos(x)}{\sin(x)} = \sqrt{3}$$
$$\text{for } 0 \leq x < 2\pi$$

A

$$x = \frac{\pi}{6}$$

B

$$x = \frac{\pi}{6} \text{ or } x = \frac{2\pi}{3} \text{ or } x = \frac{7\pi}{6}$$

C

$$x = \frac{\pi}{6} \text{ or } x = \frac{7\pi}{6}$$

D

$$x = \frac{5\pi}{6} \text{ or } x = \frac{11\pi}{6}$$

17Solve the trigonometric equation for x in the given domain.

$$\frac{2 \tan(x)}{1 - \tan^2(x)} = \frac{\sqrt{3}}{3}$$
$$\text{for } 0 \leq x < 2\pi$$

A

$$x = \frac{\pi}{12} \text{ or } x = \frac{7\pi}{12} \text{ or } x = \frac{13\pi}{12} \text{ or } x = \frac{19\pi}{12}$$

B

$$x = \frac{\pi}{12} \text{ or } x = \frac{7\pi}{12} \text{ or } x = \frac{13\pi}{12}$$

C

$$x = \frac{5\pi}{12} \text{ or } x = \frac{11\pi}{12} \text{ or } x = \frac{17\pi}{12} \text{ or } x = \frac{23\pi}{12}$$

D

$$x = \frac{\pi}{12}$$



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18Solve the trigonometric equation for x in the given domain.

$$2(\cos(2x)) = -1$$

$$\text{for } 0 \leq x < 2\pi$$

$$\text{using } \cos(2x) = \cos^2 x - \sin^2 x$$

A

$$x = \frac{\pi}{3} \text{ or } x = \frac{2\pi}{3} \text{ or } x = \frac{5\pi}{6} \text{ or } x = \frac{4\pi}{3} \text{ or } x = \frac{5\pi}{3}$$

B

$$x = \frac{\pi}{3} \text{ or } x = \frac{2\pi}{3} \text{ or } x = \frac{4\pi}{3}$$

C

$$x = \frac{\pi}{3}$$

D

$$x = \frac{\pi}{3} \text{ or } x = \frac{2\pi}{3} \text{ or } x = \frac{4\pi}{3} \text{ or } x = \frac{5\pi}{3}$$

19Solve the trigonometric equation for x in the given domain.

$$\csc^2(x) = \frac{4}{3}$$

$$\text{for } 0 \leq x < 2\pi$$

A

$$x = \frac{\pi}{3} \text{ or } x = \frac{2\pi}{3} \text{ or } x = \frac{4\pi}{3}$$

B

$$x = \frac{\pi}{3} \text{ or } x = \frac{2\pi}{3} \text{ or } x = \frac{4\pi}{3} \text{ or } x = \frac{5\pi}{3}$$

C

$$x = \frac{\pi}{3}$$

D

$$x = \frac{\pi}{3} \text{ or } x = \frac{2\pi}{3} \text{ or } x = \frac{5\pi}{6} \text{ or } x = \frac{4\pi}{3} \text{ or } x = \frac{5\pi}{3}$$