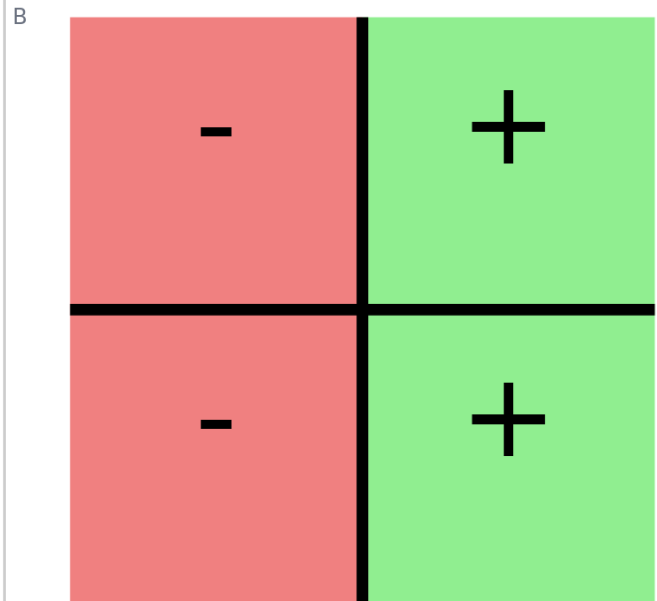
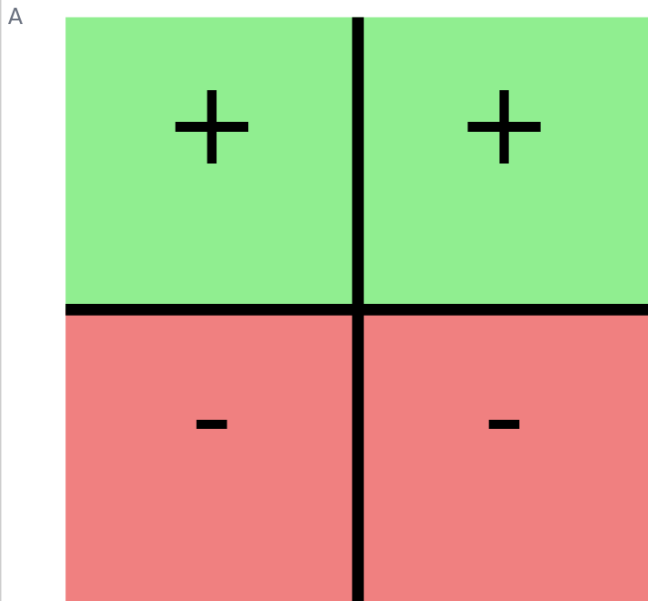
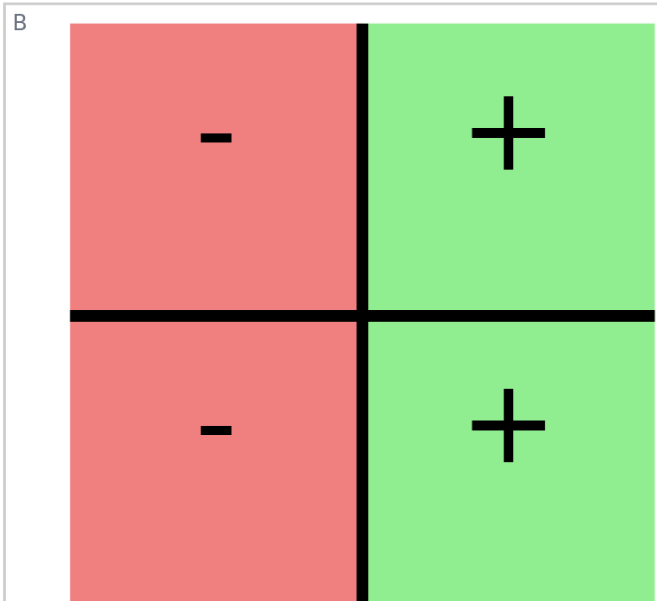
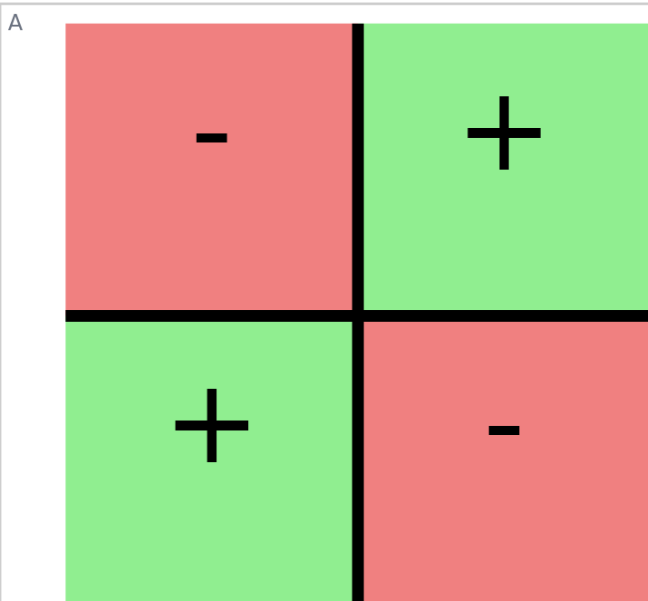


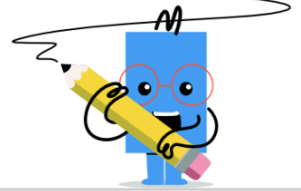
Trigonometric Identities - Practice

- 1 In which quadrants is this trig ratio positive/negative?
 $\cos(\theta)$



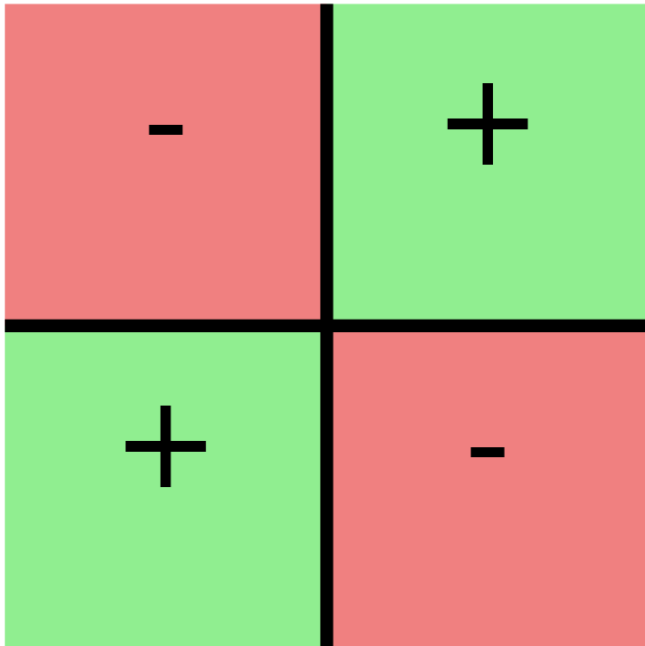
- 2 In which quadrants is this trig ratio positive/negative?
 $\sec(\gamma)$





Trigonometric Identities - Practice

3 Which trig ratio would have these signs by quadrant?



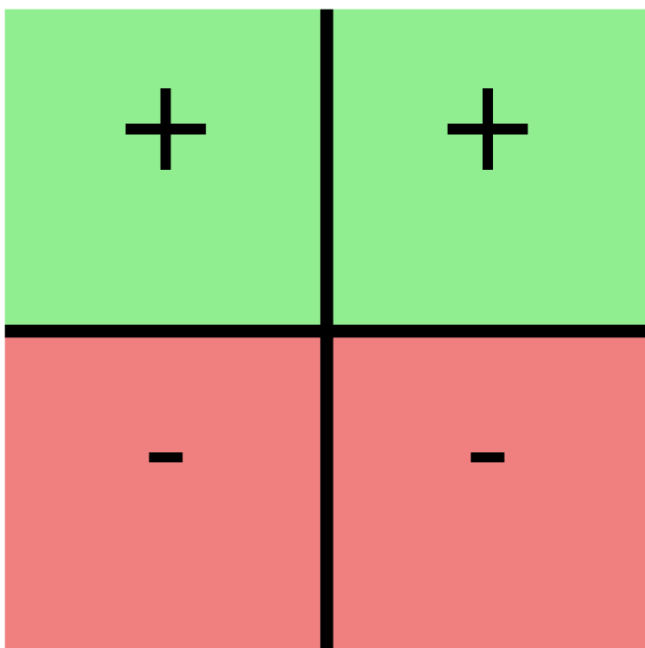
A

$$\tan(\theta)$$

B

$$\sin(\theta)$$

4 Which trig ratio would have these signs by quadrant?

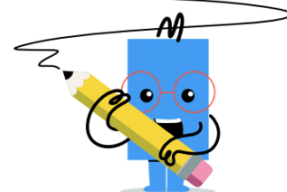


A

$$\sec(\gamma)$$

B

$$\csc(\gamma)$$

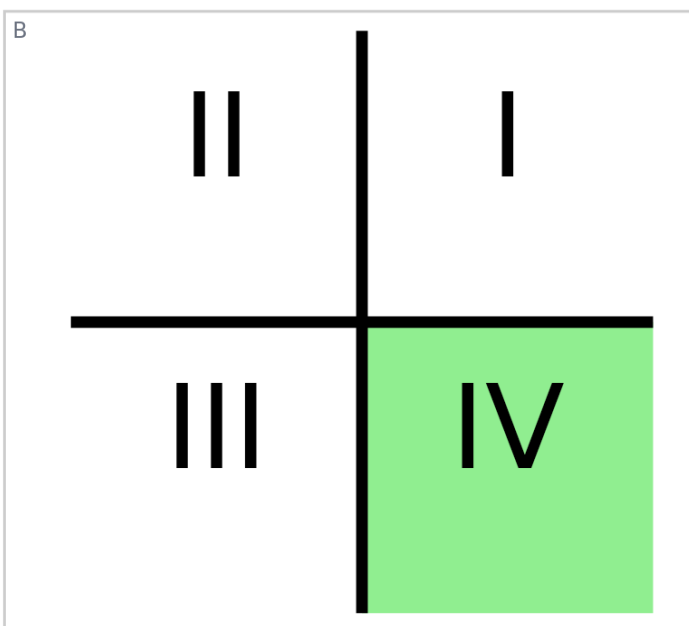
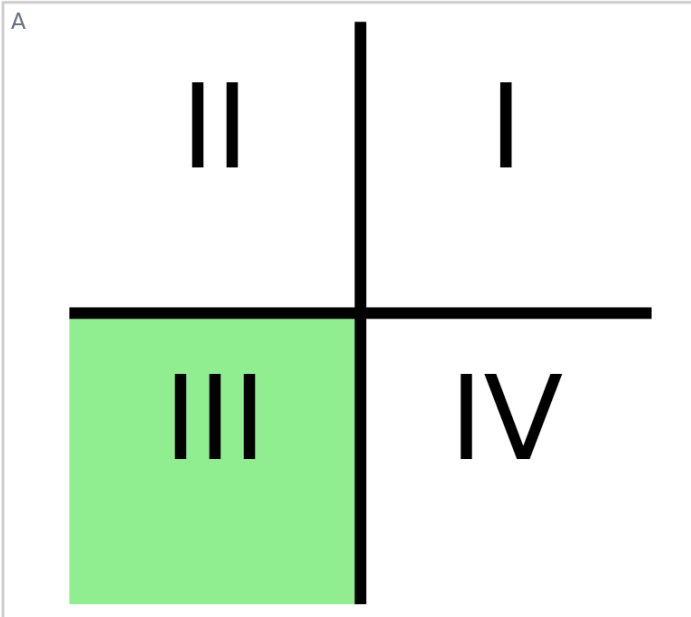


Trigonometric Identities - Practice

5 In which quadrant would these trig ratios have these signs?

$\sin(\gamma) \rightarrow$ negative

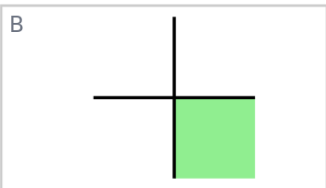
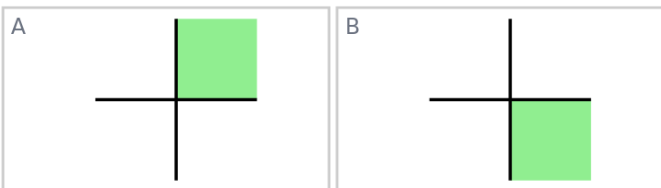
$\cos(\gamma) \rightarrow$ negative



6 In which quadrant would these trig ratios have these signs?

$\csc(\gamma) \rightarrow$ positive

$\tan(\gamma) \rightarrow$ positive



8 Which angle would have trig ratios with these signs?

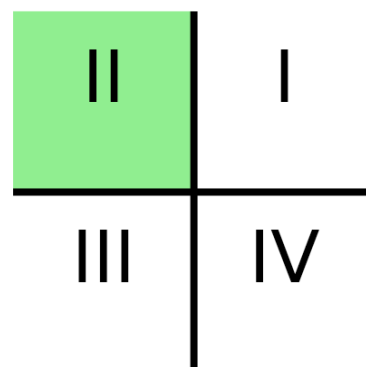
$\sin(\alpha) \rightarrow$ positive

$\tan(\alpha) \rightarrow$ positive

A $\alpha = 30^\circ$

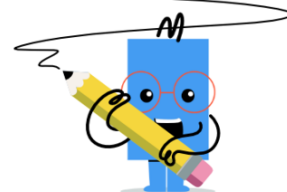
B $\alpha = 150^\circ$

7 What are the signs on trig ratios in this quadrant?



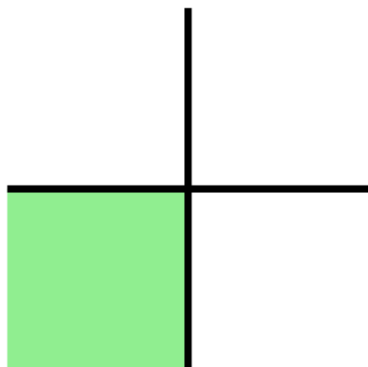
A $\sin \rightarrow$ positive
 $\cos \rightarrow$ negative

B $\sin \rightarrow$ positive
 $\cos \rightarrow$ positive



Trigonometric Identities - Practice

- 9** What are the signs on trig ratios in this quadrant?



A $\sec \rightarrow \text{negative}$
 $\sin \rightarrow \text{negative}$

B $\sec \rightarrow \text{positive}$
 $\sin \rightarrow \text{negative}$

- 10** Which angle would have trig ratios with these signs?

 $\sec(\beta) \rightarrow \text{positive}$ $\csc(\beta) \rightarrow \text{negative}$

A

$$\beta = 60^\circ$$

B

$$\beta = 315^\circ$$

- 11** Which angle would have trig ratios with these signs?

 $\tan(\gamma) \rightarrow \text{negative}$ $\sin(\gamma) \rightarrow \text{negative}$

A

$$\gamma = \frac{7\pi}{4} \text{ rad}$$

B

$$\gamma = \frac{5\pi}{6} \text{ rad}$$

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

$$300^\circ$$

A

 $\sin \rightarrow \text{positive}$
 $\tan \rightarrow \text{negative}$

B

 $\sin \rightarrow \text{negative}$
 $\tan \rightarrow \text{negative}$

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

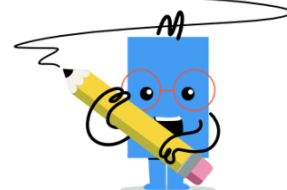
$$315^\circ$$

A

 $\tan \rightarrow \text{negative}$
 $\sin \rightarrow \text{positive}$

B

 $\tan \rightarrow \text{negative}$
 $\sin \rightarrow \text{negative}$



Trigonometric Identities - Practice

14 Which angle would have trig ratios with these signs?

$\cot(\beta) \rightarrow \text{positive}$

$\sin(\beta) \rightarrow \text{negative}$

A

$$\beta = \frac{5\pi}{6} \text{ rad}$$

B

$$\beta = \frac{7\pi}{6} \text{ rad}$$

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

$$\frac{7\pi}{4} \text{ rad}$$

A

$\sin \rightarrow \text{positive}$
 $\cos \rightarrow \text{positive}$

B

$\sin \rightarrow \text{negative}$
 $\cos \rightarrow \text{positive}$

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

$$\frac{5\pi}{3} \text{ rad}$$

A

$\cot \rightarrow \text{negative}$
 $\cos \rightarrow \text{positive}$

B

$\cot \rightarrow \text{negative}$
 $\cos \rightarrow \text{negative}$

17 In which quadrant would these trig ratios have these signs?

$\cos(\beta) \rightarrow \text{positive}$

$\sin(\beta) \rightarrow \text{negative}$

A

IV

B

I

C

III

D

II

18 In which quadrant would these trig ratios have these signs?

$\sec(\beta) \rightarrow \text{negative}$

$\cot(\beta) \rightarrow \text{positive}$

A

III

B

IV

C

II

D

I

19 What are the signs on trig ratios in this quadrant?

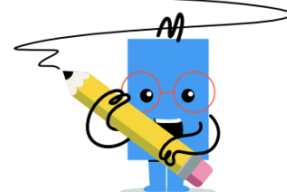
I

A

$\sin \rightarrow \text{positive}$
 $\tan \rightarrow \text{negative}$

B

$\sin \rightarrow \text{positive}$
 $\tan \rightarrow \text{positive}$



Trigonometric Identities - Practice

20 What are the signs on trig ratios in this quadrant?

IV

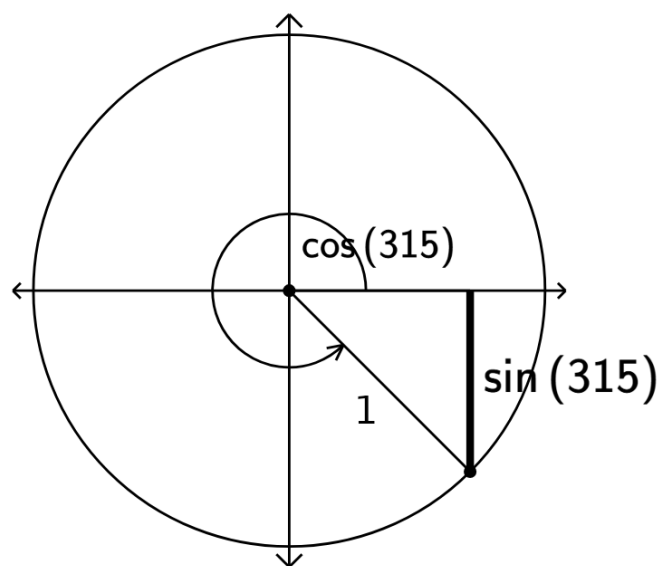
A

$\tan \rightarrow$ negative
 $\cos \rightarrow$ positive

B

$\tan \rightarrow$ negative
 $\cos \rightarrow$ negative

21 What does Pythagoras tell us about the Y dimension of this triangle?



A

$$\sin(315^\circ) = \sqrt{1 - \cos^2(315^\circ)}$$

B

$$\sin(315^\circ) = \sqrt{\cos^2(315^\circ) + 1}$$

22 What is true about the tangent of this negative angle?

$$\tan(-\theta)$$

A

$$\tan(-\theta) = \tan(\theta)$$

B

$$\tan(-\theta) = -\tan(\theta)$$

23 What is true about the tangent of this negative angle?

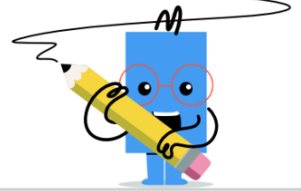
$$\tan\left(-\frac{5\pi}{6}\right)$$

A

$$\tan\left(-\frac{5\pi}{6}\right) = -\tan\left(\frac{5\pi}{6}\right)$$

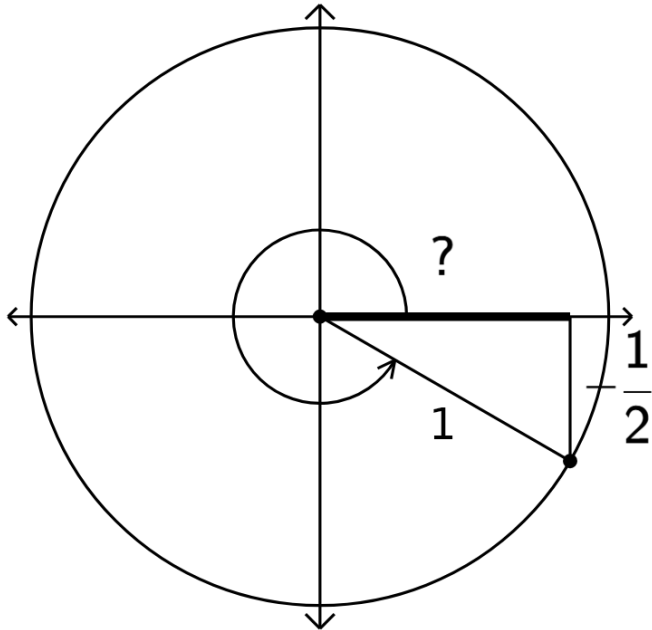
B

$$\tan\left(-\frac{5\pi}{6}\right) = \tan\left(\frac{5\pi}{6}\right)$$



Trigonometric Identities - Practice

24 What does Pythagoras tell us about the X dimension of this triangle?



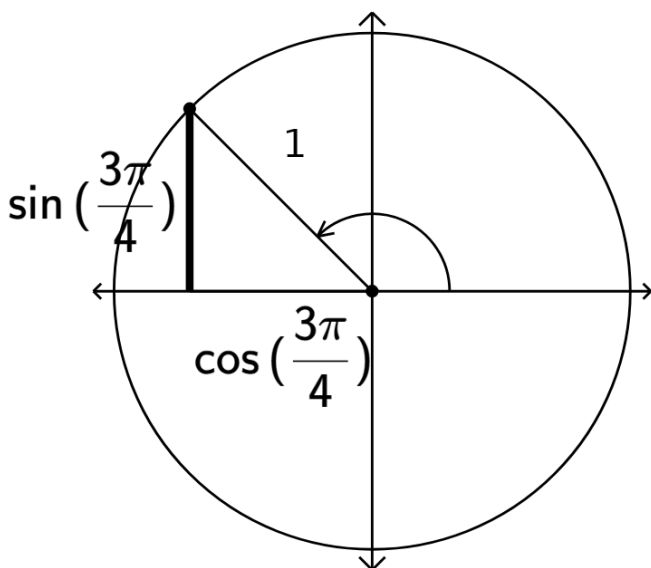
A

$$\cos(330^\circ) = \sqrt{\left(-\frac{1}{2}\right)^2 + 1}$$

B

$$\cos(330^\circ) = \sqrt{1 - \left(-\frac{1}{2}\right)^2}$$

25 What does Pythagoras tell us about the Y dimension of this triangle?

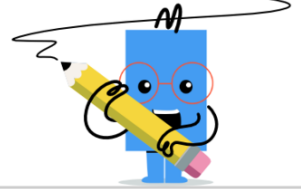


A

$$\sin\left(\frac{3\pi}{4}\right) = \sqrt{1 - \cos^2\left(\frac{3\pi}{4}\right)}$$

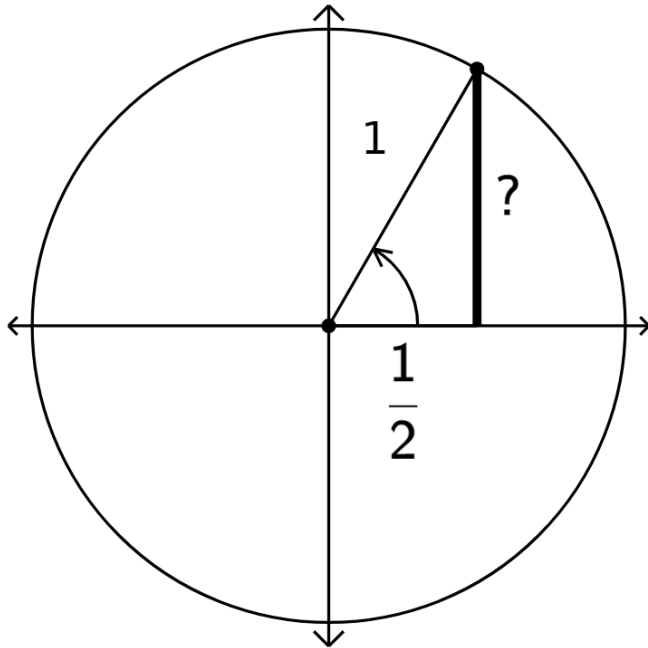
B

$$\sin\left(\frac{3\pi}{4}\right) = \sqrt{\cos^2\left(\frac{3\pi}{4}\right) + 1}$$



Trigonometric Identities - Practice

26 What does Pythagoras tell us about the Y dimension of this triangle?



A

$$\sin\left(\frac{\pi}{3}\right) = \sqrt{1 - \left(\frac{1}{2}\right)^2}$$

B

$$\sin\left(\frac{\pi}{3}\right) = \sqrt{\left(\frac{1}{2}\right)^2 + 1}$$

27 What is true about the cosine of this negative angle?

$$\cos(-120^\circ)$$

A

$$\cos(-120^\circ) = \cos(120^\circ)$$

B

$$\cos(-120^\circ) = -\cos(120^\circ)$$

28 What is true about the secant of this negative angle?

$$\sec(-\gamma)$$

A

$$\sec(-\gamma) = -\sec(\gamma)$$

B

$$\sec(-\gamma) = \sec(\gamma)$$

29 What is true about the cosecant of this negative angle?

$$\csc\left(-\frac{\pi}{6}\right)$$

A

$$\csc\left(-\frac{\pi}{6}\right) = -\csc\left(\frac{\pi}{6}\right)$$

B

$$\csc\left(-\frac{\pi}{6}\right) = \csc\left(\frac{\pi}{6}\right)$$

30 What is true about the cosecant of this negative angle?

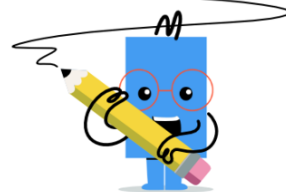
$$\csc(-30^\circ)$$

A

$$\csc(-30^\circ) = \csc(30^\circ)$$

B

$$\csc(-30^\circ) = -\csc(30^\circ)$$



Trigonometric Identities - Practice

- 31** Complete the pythagorean trig identity for this expression

$$\tan^2(\alpha)$$

A $= \sec^2(\alpha) - 1$

B $= \csc^2(\alpha) - 1$

- 32** Is this pythagorean trig identity correct?

$$\tan^2(\beta) = \csc^2(\beta) - 1$$

A

Yes

B

No

- 33** Complete the pythagorean trig identity for this expression

$$\tan^2(120^\circ)$$

A $= \csc^2(120^\circ) - 1$

B $= \sec^2(120^\circ) - 1$

- 34** Is this pythagorean trig identity correct?

$$\tan^2(135^\circ) = \sec^2(135^\circ) - 1$$

A

Yes

B

No

- 35** Complete the pythagorean trig identity for this expression

$$\tan^2\left(\frac{\pi}{4}\right)$$

A $= 1 - \sec^2\left(\frac{\pi}{4}\right)$

B $= \sec^2\left(\frac{\pi}{4}\right) - 1$

- 36** Is this pythagorean trig identity correct?

$$\sec^2\left(\frac{5\pi}{6}\right) = \tan^2\left(\frac{5\pi}{6}\right) + 1$$

A

Yes

B

No

- 37** Complete the pythagorean trig identity for this expression

$$\csc^2(\gamma)$$

A $= \tan^2(\gamma) - 1$

B $= \cot^2(\gamma) + 1$

- 38** Is this pythagorean trig identity correct?

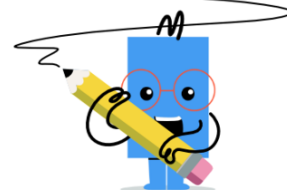
$$\cot^2(\theta) = 1 - \csc^2(\theta)$$

A

Yes

B

No



Trigonometric Identities - Practice

- 39** Complete the pythagorean trig identity for this expression

$$\cot^2(210^\circ)$$

A $= \sec^2(210^\circ) + 1$

B $= \csc^2(210^\circ) - 1$

- 40** Is this pythagorean trig identity correct?

$$\cot^2(135^\circ) = 1 - \csc^2(135^\circ)$$

A
Yes

B
No

- 41** Complete the pythagorean trig identity for this expression

$$\cot^2\left(\frac{\pi}{4}\right)$$

A $= \csc^2\left(\frac{\pi}{4}\right) - 1$

B $= 1 - \csc^2\left(\frac{\pi}{4}\right)$

- 42** Is this pythagorean trig identity correct?

$$\csc^2\left(\frac{2\pi}{3}\right) = \cot^2\left(\frac{2\pi}{3}\right) + 1$$

A
No

B
Yes

- 43** Complete the double-angle identity for this expression

$$\cos(2 \cdot \gamma)$$

A $= \frac{1 - \tan^2(\gamma)}{1 + \tan^2(\gamma)}$

B $= 1 + 2\sin^2(\gamma)$

- 44** Is this double-angle identity correct?

$$\tan(2 \cdot \beta) = 2\tan(\beta)\cot(\beta)$$

A
No

B
Yes

- 45** Complete the double-angle identity for this expression

$$\cos(2 \cdot 240^\circ)$$

A $= \frac{\tan^2(240^\circ) - 1}{1 + \tan^2(240^\circ)}$

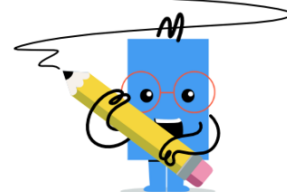
B $= \cos^2(240^\circ) - \sin^2(240^\circ)$

- 46** Is this double-angle identity correct?

$$\sin(2 \cdot 120^\circ) = \sin(120^\circ)\cos(120^\circ)$$

A
Yes

B
No



Trigonometric Identities - Practice

47 Complete the double-angle identity for this expression

$$\tan\left(2 \cdot \frac{5\pi}{6}\right)$$

A

$$= \frac{\sin\left(\frac{5\pi}{6}\right)\cos\left(\frac{5\pi}{6}\right)}{2}$$

B

$$= \frac{2\tan\left(\frac{5\pi}{6}\right)}{1 - \tan^2\left(\frac{5\pi}{6}\right)}$$

48 Is this double-angle identity correct?

$$\cos\left(2 \cdot \frac{7\pi}{4}\right) = 1 + 2\sin^2\left(\frac{7\pi}{4}\right)$$

A

Yes

B

No

49 Complete the half-angle identity for this expression

$$\sin\left(\frac{\alpha}{2}\right)$$

A

$$= \pm \sqrt{\frac{1 + \cos(\alpha)}{1 - \cos(\alpha)}}$$

B

$$= \pm \sqrt{\frac{1 - \cos(\alpha)}{2}}$$

50 Is this half-angle identity correct?

$$\tan\left(\frac{\gamma}{2}\right) = \pm \sqrt{\frac{1 + \sin(\gamma)}{2}}$$

A

Yes

B

No

51 Complete the half-angle identity for this expression

$$\cos\left(\frac{60^\circ}{2}\right)$$

A

$$= \pm \sqrt{\frac{1 + \cos(60^\circ)}{2}}$$

B

$$= \pm \sqrt{\frac{1 + \cos(60^\circ)}{1 - \cos(60^\circ)}}$$

52 Is this half-angle identity correct?

$$\cos\left(\frac{45^\circ}{2}\right) = \pm \sqrt{\frac{1 + \cos(45^\circ)}{1 - \cos(45^\circ)}}$$

A

Yes

B

No

53 Is this half-angle identity correct?

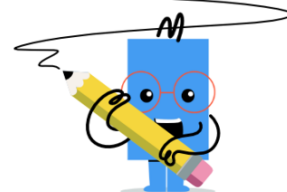
$$\cos\left(\frac{2\pi}{3}\right) = \pm \sqrt{\frac{1 + \cos\left(\frac{2\pi}{3}\right)}{1 - \cos\left(\frac{2\pi}{3}\right)}}$$

A

Yes

B

No



Trigonometric Identities - Practice

54 Complete the half-angle identity for this expression

$$\tan\left(\frac{\pi}{6}\right)$$

A

$$= \pm \sqrt{\frac{1 + \sin\left(\frac{\pi}{6}\right)}{2}}$$

B

$$= \pm \sqrt{\frac{1 - \cos\left(\frac{\pi}{6}\right)}{1 + \cos\left(\frac{\pi}{6}\right)}}$$

55 Complete the cofunction identity for this expression

$$\csc(\alpha)$$

A

$$= \sin(90^\circ - \alpha)$$

B

$$= \sec(90^\circ - \alpha)$$

56 Is this cofunction identity correct?

$$\sin(\theta) = \cos(90^\circ - \theta)$$

A

Yes

B

No

57 Complete the cofunction identity for this expression

$$\cos(30^\circ)$$

A

$$= \sec(90^\circ - 30^\circ)$$

B

$$= \sin(90^\circ - 30^\circ)$$

58 Is this cofunction identity correct?

$$\sec(135^\circ) = \cos(90^\circ - 135^\circ)$$

A

No

B

Yes

59 Complete the cofunction identity for this expression

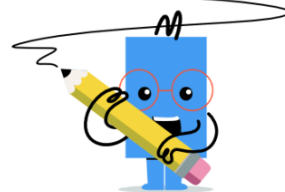
$$\tan\left(\frac{7\pi}{6}\right)$$

A

$$= \cot\left(\frac{\pi}{2} + \frac{7\pi}{6}\right)$$

B

$$= \cot\left(\frac{\pi}{2} - \frac{7\pi}{6}\right)$$



Trigonometric Identities - Practice

60 Is this cofunction identity correct?

$$\csc\left(\frac{4\pi}{3}\right) = \sin\left(\frac{\pi}{2} - \frac{4\pi}{3}\right)$$

A

Yes

B

No

61 Complete the sum/difference identity for this expression

$$\tan(\gamma + \beta)$$

A

$$= \frac{\cos(\gamma) + \sin(\beta)}{1 - \tan(\gamma)\tan(\beta)}$$

B

$$= \frac{\tan(\gamma) + \tan(\beta)}{1 - \tan(\gamma)\tan(\beta)}$$

62 Is this sum/difference identity correct?

$$\cos(\gamma - \alpha) = \sin(\gamma)\cos(\alpha) + \cos^2(\gamma)$$

A

Yes

B

No

63 Complete the sum/difference identity for this expression

$$\sin(330^\circ + 300^\circ)$$

A

$$= \sin^2(330^\circ) - \cos(330^\circ)\sin(300^\circ)$$

B

$$= \sin(330^\circ)\cos(300^\circ) + \cos(330^\circ)\sin(300^\circ)$$

64 Is this sum/difference identity correct?

$$\cos(225^\circ + 30^\circ) = \sin(225^\circ)\cos(30^\circ) + \cos(225^\circ)\sin(30^\circ)$$

A

Yes

B

No

65 Complete the sum/difference identity for this expression

$$\tan\left(\frac{5\pi}{6} - \frac{\pi}{6}\right)$$

A

$$= \frac{\tan\left(\frac{5\pi}{6}\right) - \tan\left(\frac{\pi}{6}\right)}{1 + \tan\left(\frac{5\pi}{6}\right)\tan\left(\frac{\pi}{6}\right)}$$

B

$$= \frac{\tan\left(\frac{5\pi}{6}\right) + \tan\left(\frac{\pi}{6}\right)}{\tan^2\left(\frac{5\pi}{6}\right)\tan^2\left(\frac{\pi}{6}\right)}$$

66 Is this sum/difference identity correct?

$$\tan\left(\frac{2\pi}{3} + \frac{7\pi}{4}\right) = \frac{\tan\left(\frac{2\pi}{3}\right) + \tan\left(\frac{7\pi}{4}\right)}{1 - \tan\left(\frac{2\pi}{3}\right)\tan\left(\frac{7\pi}{4}\right)}$$

A

Yes

B

No

67 Complete the power reducing identity for this expression

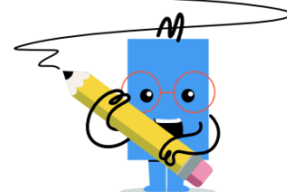
$$\cos^2(\theta)$$

A

$$= \frac{1 + \cos(2 \cdot \theta)}{2}$$

B

$$= \frac{1 - \cos(2 \cdot \theta)}{1 + \cos(\theta)}$$



Trigonometric Identities - Practice

68 Is this power reducing identity correct?

$$\cos^2(\theta) = \frac{1 + \cos(2 \cdot \theta)}{2}$$

A

Yes

B

No

69 Complete the power reducing identity for this expression

$$\sin^2(120^\circ)$$

A

$$= \frac{1 - \cos(2 \cdot 120^\circ)}{2}$$

B

$$= \frac{1 + \cos(2 \cdot 120^\circ)}{1 - \cos(120^\circ)}$$

70 Is this power reducing identity correct?

$$\tan^2(330^\circ) = \frac{1 - \cos(2 \cdot 330^\circ)}{1 + \cos(330^\circ)}$$

A

No

B

Yes

71 Is this power reducing identity correct?

$$\cos^2\left(\frac{\pi}{4}\right) = \frac{1 + \cos\left(2 \cdot \frac{\pi}{4}\right)}{2}$$

A

Yes

B

No

72 Complete the power reducing identity for this expression

$$\sin^2\left(\frac{7\pi}{4}\right)$$

A

$$= \frac{2}{1 + \cos\left(\frac{7\pi}{4}\right)}$$

B

$$= \frac{1 - \cos\left(2 \cdot \frac{7\pi}{4}\right)}{2}$$

73 Complete the sum to product identity for this expression

$$\sin(\beta) - \sin(\theta)$$

A

$$= 2\cos\left(\frac{(\beta + \theta)}{2}\right) - \sin\left(\frac{(\beta + \theta)}{2}\right)$$

B

$$= 2\sin\left(\frac{(\beta - \theta)}{2}\right)\cos\left(\frac{(\beta + \theta)}{2}\right)$$

74 Is this sum to product identity correct?

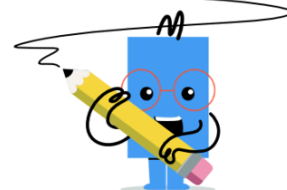
$$\sin(\gamma) - \sin(\alpha) = 2\cos\left(\frac{(\gamma + \alpha)}{2}\right) - \sin\left(\frac{(\gamma + \alpha)}{2}\right)$$

A

No

B

Yes



Trigonometric Identities - Practice

75 Complete the sum to product identity for this expression

$$\sin(120^\circ) + \sin(45^\circ)$$

A $= 2\sin\left(\frac{(120^\circ + 45^\circ)}{2}\right)\cos\left(\frac{(120^\circ - 45^\circ)}{2}\right)$

B $= 2\cos\left(\frac{(120^\circ - 45^\circ)}{2}\right) - \sin\left(\frac{(120^\circ + 45^\circ)}{2}\right)$

76 Is this sum to product identity correct?

$$\sin(60^\circ) + \sin(315^\circ) = 2\sin\left(\frac{(60^\circ + 315^\circ)}{2}\right)\cos\left(\frac{(60^\circ - 315^\circ)}{2}\right)$$

A

Yes

B

No

77 Complete the sum to product identity for this expression

$$\sin\left(\frac{5\pi}{4}\right) + \sin\left(\frac{\pi}{6}\right)$$

A $= 2\sin\left(\frac{(\frac{5\pi}{4} + \frac{\pi}{6})}{2}\right)\cos\left(\frac{(\frac{5\pi}{4} - \frac{\pi}{6})}{2}\right)$

B $= 2\cos\left(\frac{(\frac{5\pi}{4} - \frac{\pi}{6})}{2}\right) - \sin\left(\frac{(\frac{5\pi}{4} + \frac{\pi}{6})}{2}\right)$

78 Is this sum to product identity correct?

$$\sin\left(\frac{7\pi}{4}\right) - \sin\left(\frac{7\pi}{6}\right) = 2\cos\left(\frac{(\frac{7\pi}{4} + \frac{7\pi}{6})}{2}\right) - \sin\left(\frac{(\frac{7\pi}{4} - \frac{7\pi}{6})}{2}\right)$$

A

No

B

Yes

79 Complete the product to sum identity for this expression

$$\cos(\beta)\cos(\gamma)$$

A

$$= \frac{1}{2}[\cos(\beta + \gamma) + \cos^2(\beta + \gamma)]$$

B

$$= \frac{1}{2}[\cos(\beta - \gamma) + \cos(\beta + \gamma)]$$

80 Is this product to sum identity correct?

$$\sin(\alpha)\sin(\theta) = \frac{1}{2}[\cos(\alpha - \theta) - \cos(\alpha + \theta)]$$

A

Yes

B

No