

Using Right Triangles in Trigonometry

Name _____

Class _____

Date _____

ANSWERS

1a _____

1b _____

2a _____

2b _____

3a _____

3b _____

4a _____

4b _____

5a _____

5b _____

6a _____

6b _____

7a _____

7b _____

Evaluate the followings.

1. a. If $\cos \alpha = \frac{3}{5}$ and $0 < \alpha < \frac{\pi}{2}$ find $\sin \frac{\alpha}{2}$ and $ctg \alpha$

b. If $\sin \alpha = \frac{4}{5}$ and $0 < \alpha < \frac{\pi}{2}$ find $tg \alpha$ and $\cos \frac{\alpha}{2}$

2. a. If $\cos \alpha = \frac{-15}{17}$ and $\frac{\pi}{2} < \alpha < \pi$ find $\sin \alpha$ and $ctg \alpha$

b. If $\sin \alpha = -0.6$ and $\pi < \alpha < \frac{3\pi}{2}$ find $\cos \alpha$ and $tg \alpha$

3. a. Find $\cos 2\alpha$ if $\alpha = \frac{\pi}{2}$

b. Find $\sin 2\alpha$ if $\alpha = -\frac{\pi}{6}$

Simplify the expressions

4. a. $(\sin \alpha + \cos \alpha)^2 + 1 - \sin 2\alpha$ b. $(\sin \alpha - \cos \alpha)^2 - 1 + 4 \sin 2\alpha$

5. a. $\frac{\sin^2 \alpha}{1 + \cos \alpha} + \cos \alpha$ b. $\frac{\cos^2 \alpha}{\sin \alpha - 1} + \sin \alpha$

6. a. $\frac{\sin 35^\circ + \sin 85^\circ}{\cos 25^\circ}$ b. $\frac{\cos 24^\circ - \cos 84^\circ}{\sin 54^\circ}$

7. a. $2 \sin 30^\circ - \cos 150^\circ + tg 120^\circ$ b. $2 \cos 60^\circ - \sin 240^\circ + tg 150^\circ$

A

8a

8b

9a

9b

10a

10b

11a

11b

12a

12b

13a

13b

$$8. \quad \text{a. } \frac{\sin(\pi - \alpha) \times \operatorname{ctg}\left(\frac{3\pi}{2}\right)}{\operatorname{tg}(2\pi - \alpha) \times \cos\left(\frac{\pi}{2} + \alpha\right)} \quad \text{b. } \frac{\cos(\pi - \alpha) \times \operatorname{tg}\left(\frac{3\pi}{2}\right)}{\operatorname{ctg}(2\pi - \alpha) \times \sin\left(\frac{\pi}{2} + \alpha\right)}$$

$$9. \quad \text{a. } \frac{1}{1 + \operatorname{tg}^2 \alpha} + \frac{1}{1 + \operatorname{ctg}^2 \alpha} \quad \text{b. } \frac{\operatorname{tg} \alpha}{1 - \operatorname{tg}^2 \alpha} \times \frac{\operatorname{ctg}^2 \alpha - 1}{\operatorname{ctg} \alpha}$$

$$10. \quad \text{a. } \frac{\operatorname{tg}(2\pi + \alpha) \times \cos\left(\frac{\pi}{2} - \alpha\right)}{\sin(\pi + \alpha) \times \operatorname{ctg}\left(\frac{3\pi}{2} - \alpha\right)} \quad \text{b. } \frac{\operatorname{ctg}(2\pi + \alpha) \times \sin\left(\frac{\pi}{2} - \alpha\right)}{\cos(\pi + \alpha) \times \operatorname{tg}\left(\frac{3\pi}{2} - \alpha\right)}$$

$$11. \quad \text{a. } \frac{\cos \alpha - \sin \alpha}{\cos 2\alpha} \quad \text{b. } \frac{\sin \frac{\alpha}{2} - \cos \frac{\alpha}{2}}{\cos \alpha}$$

$$12. \quad \text{a. } \frac{(\sin \alpha + \cos \alpha)^2 - 1}{\operatorname{tg} \alpha - \sin \alpha \times \cos \alpha} \quad \text{b. } \frac{(\cos \alpha + \sin \alpha)^2 - 1}{\operatorname{ctg} \alpha - \sin \alpha \times \cos \alpha}$$

$$13. \quad \text{a. } \frac{\sin \alpha \times \cos(\pi + \alpha) \times \cos(\pi - 2\alpha)}{\cos 4\alpha}$$

$$\text{b. } \frac{\sin(\pi - \alpha) \times \sin\left(\frac{\pi}{2} - 2\alpha\right) \times \cos(\pi + \alpha)}{\cos 4\alpha}$$

A