

**F.TF.C.9: Angle Sum and Difference Identities 1b**

- 1 The expression  $\cos 4x \cos 3x + \sin 4x \sin 3x$  is equivalent to
- 2 The expression  $\cos 40^\circ \cos 10^\circ + \sin 40^\circ \sin 10^\circ$  is equivalent to
- 3  $\cos 70^\circ \cos 40^\circ - \sin 70^\circ \sin 40^\circ$  is equivalent to
- 4 Which expression is equivalent to  $\cos P \cos 50 - \sin P \sin 50$ ?
- 5 Which expression is equivalent to  $\sin 22^\circ \cos 18^\circ + \cos 22^\circ \sin 18^\circ$ ?
- 6 The expression  $\cos 80^\circ \cos 20^\circ - \sin 80^\circ \sin 20^\circ$  is equivalent to
- 7  $\sin 50^\circ \cos 30^\circ + \cos 50^\circ \sin 30^\circ$  is equivalent to
- 8 The expression  $\cos 70^\circ \cos 10^\circ + \sin 70^\circ \sin 10^\circ$  is equivalent to
- 9 The expression  $\cos 80^\circ \cos 70^\circ + \sin 80^\circ \sin 70^\circ$  is equivalent to
- 10 The expression  $\sin 80^\circ \cos 70^\circ + \cos 80^\circ \sin 70^\circ$  is equivalent to
- 11 If  $\sin x = \sin y = a$  and  $\cos x = \cos y = b$ , then  $\cos(x - y)$  is
- 12 Express  $\sin 75^\circ \cos 15^\circ - \cos 75^\circ \sin 15^\circ$  as a single trigonometric function of a positive acute angle.
- 13 Which expression is equivalent to  $\cos 100^\circ \cos 80^\circ - \sin 100^\circ \sin 80^\circ$ ?
- 14 Which expression is equivalent to  $\sin 42^\circ \cos 48^\circ + \cos 42^\circ \sin 48^\circ$ ?
- 15 The value of  $\cos 75^\circ \cos 15^\circ - \sin 75^\circ \sin 15^\circ$  is
- 16 What is the value of  $\sin 210^\circ \cos 30^\circ - \cos 210^\circ \sin 30^\circ$ ?
- 17 The value of  $\cos 16^\circ \cos 164^\circ - \sin 16^\circ \sin 164^\circ$  is
- 18 The value of  $\sin 170^\circ \cos 20^\circ - \cos 170^\circ \sin 20^\circ$  is
- 19 Evaluate:  $\sin 300^\circ \cos 90^\circ + \cos 300^\circ \sin 90^\circ$
- 20 Evaluate in radical form:  
 $\sin 90^\circ \cos 30^\circ - \cos 90^\circ \sin 30^\circ$
- 21 The expression  $\cos(A - B) - \cos(A + B)$  is equal to
- 22 For all values of  $A$  and  $B$  for which the expressions are defined, prove that the following is an identity:  
$$\frac{\sin(A + B) + \sin(A - B)}{\sin(A + B) - \sin(A - B)} = \frac{\tan A}{\tan B}$$

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**Answer Section**

1 ANS:  
 $\cos x$

REF: fall0910a2

2 ANS:  
 $\cos 30^\circ$

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

$$\cos(40 - 10) = \cos 40 \cos 10 + \sin 40 \sin 10$$
$$\cos 30$$

REF: 010401b

3 ANS:  
 $\cos 110^\circ$

REF: 068835siii

4 ANS:  
 $\cos(P + 50)$

REF: 081604a2

5 ANS:  
 $\sin 40^\circ$

REF: 019629siii

6 ANS:  
 $\cos 100^\circ$

REF: 019721siii

7 ANS:  
 $\sin 80^\circ$

REF: 019819siii

8 ANS:  
 $\cos 60^\circ$

REF: 019917siii

9 ANS:  
 $\cos 10^\circ$

REF: 080111siii

10 ANS:  
 $\sin 150^\circ$

REF: 010317siii

11 ANS:

$$b^2 + a^2$$

$$\cos(x - y) = \cos x \cos y + \sin x \sin y$$

$$= b \cdot b + a \cdot a$$

$$= b^2 + a^2$$

REF: 061421a2

12 ANS:

$$\sin 60^\circ$$

REF: 089708siii

13 ANS:

$$-1$$

REF: 019521siii

14 ANS:

$$1$$

REF: 018621siii

15 ANS:

$$0$$

REF: 089330siii

16 ANS:

$$0$$

REF: 089019siii

17 ANS:

$$-1$$

REF: 069816siii

18 ANS:

$$\frac{1}{2}$$

REF: 010216siii

19 ANS:

$$\frac{1}{2}$$

REF: 019410siii

20 ANS:

$$\frac{\sqrt{3}}{2}$$

REF: 088906siii

21 ANS:  
 $2 \sin A \sin B$

REF: 088631siii

22 ANS:

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

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

$$\frac{2 \sin A \cos B}{2 \cos A \sin B} = \frac{\sin A \cos B}{\cos A \sin B}$$

$$\frac{\sin A \cos B}{\cos A \sin B} = \frac{\sin A \cos B}{\cos A \sin B}$$

REF: 089742siii