A2.A.76: Angle Sum and Difference Identities 2: Apply the angle sum and difference formulas for trigonometric functions

1 The expression $\cos 4x \cos 3x + \sin 4x \sin 3x$ is equivalent to

2 The expression $\cos 40° \cos 10° + \sin 40° \sin 10°$ is equivalent to

3 $\text{Cos}70° \cos 40° - \sin 70° \sin 40°$ is equivalent to

4 Which expression is equivalent to $\sin 22° \cos 18° + \cos 22° \sin 18°$?

5 The expression $\cos 80° \cos 20° - \sin 80° \sin 20°$ is equivalent to

6 $\text{Sin}50° \cos 30° + \cos 50° \sin 30°$ is equivalent to

7 The expression $\cos 70° \cos 10° + \sin 70° \sin 10°$ is equivalent to

8 The expression $\cos 80° \cos 70° + \sin 80° \sin 70°$ is equivalent to

9 The expression $\sin 80° \cos 70° + \cos 80° \sin 70°$ is equivalent to

10 If $\sin x = \sin y = a$ and $\cos x = \cos y = b$, then $\cos(x - y)$ is

11 Express $\sin 75° \cos 15° - \cos 75° \sin 15°$ as a single trigonometric function of a positive acute angle.

12 Which expression is equivalent to $\cos 100° \cos 80° - \sin 100° \sin 80°$?

13 Which expression is equivalent to $\sin 42° \cos 48° + \cos 42° \sin 48°$?

14 The value of $\cos 75° \cos 15° - \sin 75° \sin 15°$ is

15 What is the value of $\sin 210° \cos 30° - \cos 210° \sin 30°$?

16 The value of $\cos 16° \cos 164° - \sin 16° \sin 164°$ is

17 The value of $\sin 170° \cos 20° - \cos 170° \sin 20°$ is

18 Evaluate: $\sin 300° \cos 90° + \cos 300° \sin 90°$

19 Evaluate in radical form: $\sin 90° \cos 30° - \cos 90° \sin 30°$

20 The expression $\cos(A - B) - \cos(A + B)$ is equal to

21 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:
$\cos 30°$
$\cos(A - B) = \cos A \cos B + \sin A \sin B$
$\cos(40 - 10) = \cos 40 \cos 10 + \sin 40 \sin 10$
$\cos 30$

REF: 010401b

3 ANS:
$\cos 110°$

REF: 068835siii

4 ANS:
$\sin 40°$

REF: 019629siii

5 ANS:
$\cos 100°$

REF: 019721siii

6 ANS:
$\sin 80°$

REF: 019819siii

7 ANS:
$\cos 60°$

REF: 019917siii

8 ANS:
$\cos 10°$

REF: 080111siii

9 ANS:
$\sin 150°$

REF: 010317siii

10 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
11 ANS:
$\sin 60°$

REF: 089708siii
12 ANS:
-1

REF: 019521siii
13 ANS:
1

REF: 018621siii
14 ANS:
0

REF: 089330siii
15 ANS:
0

REF: 089019siii
16 ANS:
-1

REF: 069816siii
17 ANS:
$\frac{1}{2}$

REF: 010216siii
18 ANS:
$\frac{1}{2}$

REF: 019410siii
19 ANS:
$\frac{\sqrt{3}}{2}$

REF: 088906siii

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

REF: 088631siii

21 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