PRINTABLE VERSION

Quiz 11

You scored 100 out of 100

Question 1

Your answer is CORRECT.

Use the appropriate angle-sum formula to simplify the following expression:

$$\cos(3x)\cos(10x) - \sin(3x)\sin(10x)$$

a) $\sin(-7x)$

b) $\sin(13x)$

c) $\cos(30x)$

d) $\cos(-7x)$

e) $\cos(13x)$

f) None of the above.

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

$A = 3x \quad B = 10x$

$\cos(3x+10x) = \cos(13x)$

Question 2

Your answer is CORRECT.

Use the appropriate angle-sum formula to simplify the following expression:

$$\sin(5x)\cos(4x) - \cos(5x)\sin(4x)$$

a) $\cos(9x)$

b) $\sin(9x)$

c) $\cos(20x)$

d) $\cos(x)$

e) $\sin(x)$

f) None of the above.

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

$A = 5x$

$B = 4x$

$\sin(5x-4x) = \sin(x)$

Question 3

Your answer is CORRECT.

Given $\cos(x) = {}^1\!/_5$ with $0^o < x < 90^o$, and $\cos(y) = {}^1\!/_7$ with $270^o < y < 360^o$. Find $\cos(x+y)$.

a) $\frac{1 + 24\sqrt{2}}{(35)}$

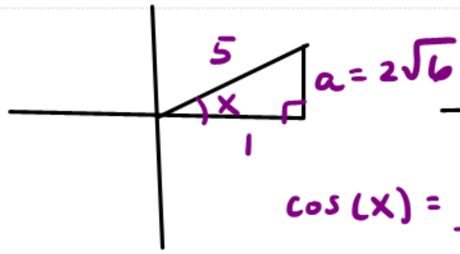
b) $\frac{1 - 24\sqrt{2}}{(35)}$

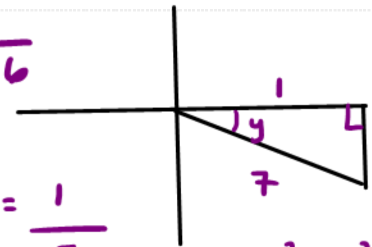
c) $\frac{1153}{35}$

d) $\frac{1 + 20\sqrt{3}}{(35)}$

e) $\frac{1 + 4\sqrt{78}}{(35)}$

f) None of the above.





$\sin(y) = \frac{-4\sqrt{3}}{7}$

$\sin(x) = \frac{2\sqrt{6}}{5}$

$\cos(x) = \frac{1}{5}$

$\cos(y) = \frac{1}{7}$

$1^2 + a^2 = 5^2$

$a^2 = 24$

$a = 2\sqrt{6}$

$1^2 + b^2 = 7^2$

$b^2 = 48$

$b = 4\sqrt{3}$

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

$= \left(\frac{1}{5}\right)\left(\frac{1}{7}\right) - \left(\frac{2\sqrt{6}}{5}\right)\left(\frac{-4\sqrt{3}}{7}\right)$

$= \frac{1}{35} + \frac{8\sqrt{18}}{35} = \frac{1 + 24\sqrt{2}}{35}$

Question 4

Your answer is CORRECT.

Given $\sin(x) = {}^9\!/_{10}$ with $0^o < x < 90^o$, and $\sin(y) = {}^1\!/_3$ with $0^o < y < 90^o$. Find $\sin(x+y)$.

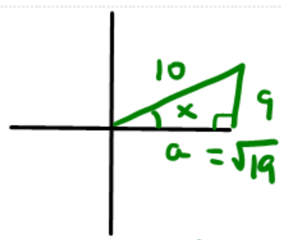
a) $\frac{18\sqrt{2} - \sqrt{19}}{(30)}$

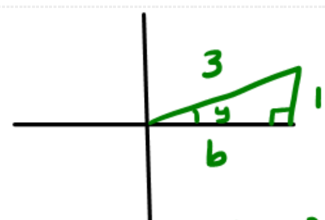
b) $\frac{91}{30}$

c) $\frac{18\sqrt{2} + \sqrt{19}}{(30)}$

d) $\frac{9\sqrt{2} + 1}{(30)}$

e) $\frac{4\sqrt{5}}{(30)}$





$\sin x = \frac{9}{10}$

$\cos(x) = \frac{\sqrt{19}}{10}$

$a^2 + 9^2 = 10^2$

$a^2 = 100 - 81$

$a = 19$

$a = \sqrt{19}$

$b^2 + 1^2 = 3^2$

$b^2 = 9 - 1$

$b = 2\sqrt{2}$

$\sin y = \frac{1}{3}$

$\cos y = \frac{2\sqrt{2}}{3}$

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

$= \left(\frac{9}{10}\right)\left(\frac{2\sqrt{2}}{3}\right) + \left(\frac{\sqrt{19}}{10}\right)\left(\frac{1}{3}\right) = \frac{18\sqrt{2}}{30} + \frac{\sqrt{19}}{30}$

$= \frac{18\sqrt{2} + \sqrt{19}}{30}$

f) None of the above.

Question 5

Your answer is CORRECT.

Given $\sin(x) = {}^{3}\!/_{7}$ with $0^{o} < x < 90^{o}$, and $\sin(y) = {}^{-4}\!/_{5}$ with $180^{o} < y < 270^{o}$. Find $\cos(x - y)$.

a) $\frac{11}{(35)}$

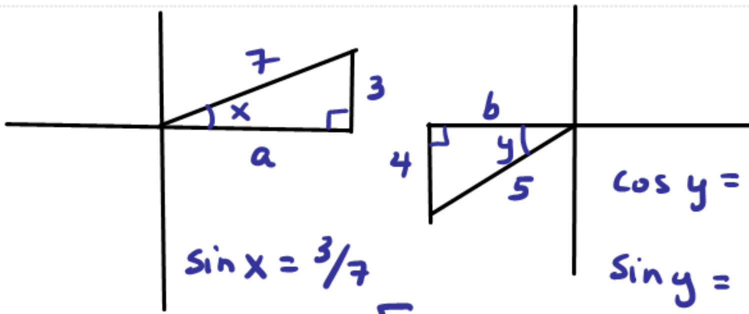
b) $\frac{72}{7}$

c) $\frac{6\sqrt{10}}{(35)}$

d) $-\frac{2\sqrt{30}}{(35)}$

e) $\frac{-6\sqrt{10} - 12}{(35)}$

f) None of the above.



$a^2+3^2=7^2$

$a^2=40$

$a=2\sqrt{10}$

$\sin x = 3/7$

$\cos x = \frac{2\sqrt{10}}{7}$

$\cos y = -3/5$

$\sin y = -4/5$

$b^2+4^2=5^2$

$b^2=9$

$b=3$

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

$= \left(\frac{2\sqrt{10}}{7}\right)\left(-3/5\right)+\left(3/7\right)\left(-4/5\right)$

$= \frac{-6\sqrt{10}}{35} - \frac{12}{35} = \frac{-6\sqrt{10}-12}{35}$

Question 6

Your answer is CORRECT.

Given $\sec(x) = -9$ with $90^{o} < x < 180^{o}$. Find $\sin(2x)$.

a) $-\frac{8}{81}\sqrt{5}$

b) $\frac{8}{81}\sqrt{5}$

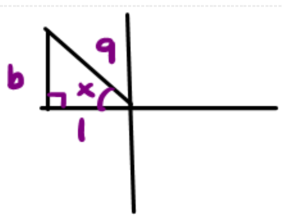
c) $-\frac{8}{9}\sqrt{5}$

d) $-\frac{2}{81}\sqrt{82}$

$\sin 2x = 2\sin x \cos x$

$\cos(x) = \frac{-1}{9}$

$\sin x = \frac{4\sqrt{5}}{9}$



$1^2+b^2=9^2$

$b^2=80$

$b=4\sqrt{5}$

$\sin 2x = 2\left(\frac{4\sqrt{5}}{9}\right)\left(\frac{-1}{9}\right)$

$\sin 2x = \frac{-8\sqrt{5}}{81}$

e) $-\frac{4}{81}\sqrt{5}$

f) None of the above.

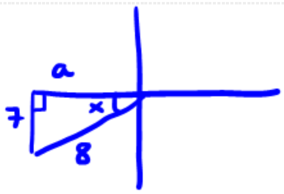
Question 7

Your answer is CORRECT.

$\sin 2x = 2\sin x\cos x$

Given $\sin(x) = {}^{-7}\!/_{8}$ with $180° < x < 270°$. Find $\sin(2x)$.

a) $-\frac{7}{32}\sqrt{15}$



$7^2 + a^2 = 8^2$

$a^2 = 15$

$a = \sqrt{15}$

$\sin x = \frac{-7}{8}$

$\cos x = \frac{-\sqrt{15}}{8}$

b) $-\frac{3}{4}\sqrt{7}$

c) $\frac{7}{32}\sqrt{15}$

$\sin(2x) = 2\left(\frac{-7}{8}\right)\left(\frac{-\sqrt{15}}{8}\right)$

$= \frac{7\sqrt{15}}{32}$

d) $\frac{1}{32}\sqrt{15}$

e) $-\frac{1}{32}\sqrt{15}$

f) None of the above.

Question 8

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

Your answer is CORRECT.

Given $\csc(x) = -5$ with $270° < x < 360°$. Find $\cos(2x)$.

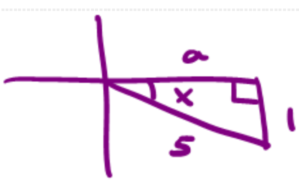
$\sin(x) = -1/5$

$a^2 + 1^2 = 5^2$

$a^2 = 24$

$a = 2\sqrt{6}$

a) ${}^{23}\!/_{25}$



b) 1

c) -2

$\cos(2x) = \left(\frac{2\sqrt{6}}{5}\right)^2 - \left(\frac{-1}{5}\right)^2$

d) ${}^{24}\!/_{25}$

$= \frac{24}{25} - \frac{1}{25} = \frac{23}{25}$

e) $\frac{1}{5}(2\sqrt{6} - 1)$

f) None of the above.

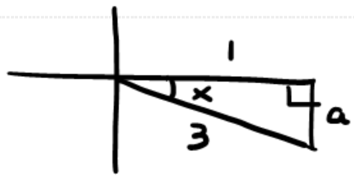
Question 9

Your answer is CORRECT.

$\tan(2x) = \dfrac{2\tan x}{1-\tan^2 x}$

Given $\cos(x) = \frac{1}{3}$ with $270° < x < 360°$. Find $\tan(2x)$.

a) $-\frac{2}{7}\sqrt{2}$



$a^2 + 1^2 = 3^2$

$a^2 = 8$

$a = 2\sqrt{2}$

b) $\frac{4}{7}\sqrt{2}$

$\tan x = -\dfrac{2\sqrt{2}}{1}$

c) $\frac{2}{9}\sqrt{2}$

$\tan 2x = \dfrac{2\left(\frac{-2\sqrt{2}}{1}\right)}{1-(8)} = \dfrac{-4\sqrt{2}}{-7} = \dfrac{4\sqrt{2}}{7}$

d) $-\frac{4}{7}\sqrt{2}$

e) $\frac{2}{7}\sqrt{2}$

f) None of the above.

$\cos\left(\frac{x}{2}\right) = \pm\sqrt{\dfrac{1+\cos x}{2}}$

Question 10

Your answer is CORRECT.

$180 < x < 270$

$90 < x/2 < 135 \rightarrow$ Quad II $(-)$

Given $\cos(x) = {}^{-1}/_{5}$ with $180° < x < 270°$. Find $\cos(x/2)$.

a) $\sqrt{2}$

$\cos\left(\frac{x}{2}\right) = -\sqrt{\dfrac{1+(-1/5)}{2}}$

b) $-\frac{1}{5}\sqrt{10}$

$= -\sqrt{\dfrac{4/5}{2}} = -\sqrt{\dfrac{4}{5}\cdot\dfrac{1}{2}}$

c) $-\frac{1}{5}\sqrt{15}$

d) $\frac{1}{5}\sqrt{10}$

$= -\sqrt{\dfrac{4}{10}}$

e) $-\frac{2}{5}\sqrt{5}$

$= \dfrac{-2}{\sqrt{10}} = \dfrac{-2\sqrt{10}}{10}$

$= -\sqrt{10}/5$

f) None of the above.

Question 11

Your answer is CORRECT.

$\sin\left(\frac{x}{2}\right) = \pm\sqrt{\frac{1-\cos x}{2}}$

Given $\sin(x) = \sqrt{5}/3$ where x is an acute angle. Find $\sin(x/2)$.

$\frac{x}{2}$ is in Quad I

a) $\frac{1}{6}\sqrt{6}$

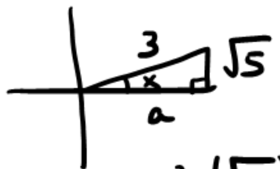
b) $\frac{1}{6}\sqrt{14}$

c) $\frac{8}{15}$

d) $\frac{1}{3}\sqrt{3}$

e) $\frac{1}{3}$

f) None of the above.



$a^2 + (\sqrt{5})^2 = 3^2$

$a^2 = 9 - 5$

$a = 2$

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

$= \sqrt{\frac{1/3}{2}}$

$= \sqrt{\frac{1}{6}}$

$= \frac{1}{\sqrt{6}} = \frac{\sqrt{6}}{6}$

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

Question 12

Your answer is CORRECT.

Evaluate:

Quad I

$$\cos\left(\frac{3}{8}\pi\right)$$

a) $-\frac{1}{2}\sqrt{2-\sqrt{2}}$

b) $\frac{1}{2}\sqrt{2+\sqrt{2}}$

c) $-\frac{1}{4}\sqrt{6}+\frac{1}{4}\sqrt{2}$

d) $-\frac{1}{2}\sqrt{2+\sqrt{2}}$

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

$= \sqrt{\frac{1-\sqrt{2}/2}{2}} = \sqrt{\frac{2-\sqrt{2}}{4}}$

$= \frac{\sqrt{2-\sqrt{2}}}{2}$

e) $\frac{1}{2}\sqrt{2-\sqrt{2}}$

f) None of the above.

Question 13

Your answer is CORRECT.

Use the appropriate angle-sum formula to simplify the following expression:

$$\cos(6x)\cos(4x) + \sin(6x)\sin(4x)$$

a) $\sin(2x)$

$\cos(\alpha - \beta) = \cos\alpha \cos\beta + \sin\alpha \sin\beta$

b) $\cos(2x)$

$\alpha = 6x \quad \beta = 4x$

c) $\cos(10x)$

$\cos(6x - 4x) = \cos(2x)$

d) $\sin(10x)$

e) $\cos(24x)$

f) None of the above.

Question 14

Your answer is CORRECT.

Use the appropriate angle-sum formula to simplify the following expression:

$$\sin(8x)\cos(5x) + \cos(8x)\sin(5x)$$

a) $\sin(3x)$

$\sin(\alpha + \beta) = \sin\alpha \cos\beta + \cos\alpha \sin\beta$

b) $\cos(40x)$

$\alpha = 8x \quad \beta = 5x$

c) $\sin(13x)$

$\sin(8x + 5x) = \sin(13x)$

d) $\cos(13x)$

e) $\cos(3x)$

f) None of the above.

Question 15

Your answer is CORRECT.

Use the appropriate angle-sum formula to simplify the following expression:

$$\cos(\pi/9)\cos(\pi/8) - \sin(\pi/9)\sin(\pi/8)$$

a) $\sin(17\pi/72)$

b) $\cos(\pi/72)$

c) $\cos(17\pi/72)$

d) $\sin(-\pi/72)$

e) $\cos(-\pi/72)$

f) None of the above.

$\cos(\alpha+\beta) = \cos\alpha\cos\beta - \sin\alpha\sin\beta$

$\alpha = \pi/9 \quad \beta = \pi/8$

$\cos\left(\frac{\pi}{9}+\frac{\pi}{8}\right) = \cos\left(\frac{8\pi}{72}+\frac{9\pi}{72}\right)$

$= \cos(17\pi/72)$

Question 16

Your answer is CORRECT.

Use the appropriate angle-sum formula to simplify the following expression:

$$\cos(170°)\cos(45°) - \sin(170°)\sin(45°)$$

a) $\sin(125°)$

b) $\cos(215°)$

c) $\cos(7650°)$

d) $\sin(215°)$

e) $\cos(125°)$

f) None of the above.

$\cos(\alpha+\beta) = \cos\alpha\cos\beta - \sin\alpha\sin\beta$

$\alpha = 170 \quad \beta = 45$

$\cos(170+45) = \cos(215)$

Question 17

Your answer is CORRECT.

Use the appropriate angle-sum formula to simplify the following expression:

$$\sin(2\pi/9)\cos(\pi/6) - \cos(2\pi/9)\sin(\pi/6)$$

a) $\sin(7\pi/18)$

b) cos($^{\pi}/_{27}$)

$\sin(\alpha - \beta) = \sin\alpha \cos\beta - \cos\alpha \sin\beta$

c) sin($^{\pi}/_{18}$)

$\alpha = 2\pi/9 \quad \beta = \pi/6$

d) cos($^{7\pi}/_{18}$)

$\sin\left(\frac{2\pi}{9} - \frac{\pi}{6}\right) = \sin\left(\frac{4\pi - 3\pi}{18}\right) = \sin\left(\frac{\pi}{18}\right)$

e) cos($^{\pi}/_{18}$)

f) None of the above.

Question 18

Your answer is CORRECT.

Use the appropriate angle-sum formula to simplify the following expression:

sin(250°) cos(75°) - cos(250°) sin(75°)

a) sin(325°)

$\sin(\alpha - \beta) = \sin\alpha \cos\beta - \cos\alpha \sin\beta$

b) cos(18750°)

$\alpha = 250 \quad \beta = 75$

c) sin(175°)

$\sin(250 - 75) = \sin(175)$

d) cos(325°)

e) cos(175°)

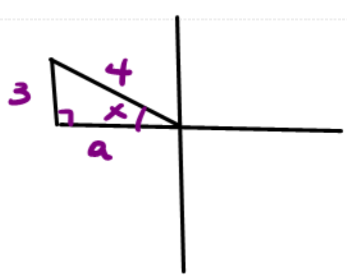
f) None of the above.

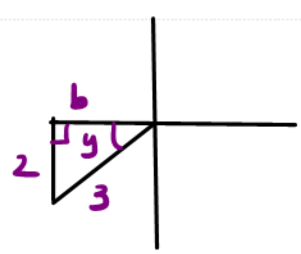
Question 19

Your answer is CORRECT.

Given $\sin(x) = {}^3/_4$ with $90^o < x < 180^o$, and $\sin(y) = {}^{-2}/_3$ with $180^o < y < 270^o$. Find $\sin(x - y)$.

a) $\frac{1}{12}\sqrt{7}\sqrt{5} + \frac{1}{2}$





$2^2 + b^2 = 3^2$

$b^2 = 9 - 4$

$b = \sqrt{5}$

b) $-\frac{1}{4}\sqrt{5}$

$\sin x = 3/4$

$\cos x = -\sqrt{7}/4$

$\sin y = -2/3$

$\cos y = -\frac{\sqrt{5}}{3}$

c) $-\frac{1}{4}\sqrt{5} - \frac{1}{6}\sqrt{7}$

$3^2 + a^2 = 4^2$

$a^2 = 16 - 9$

$a = \sqrt{7}$

d) $\frac{1}{12}\sqrt{7}\sqrt{5} - \frac{1}{2}$

e) $-\frac{1}{4}\sqrt{5} + \frac{1}{6}\sqrt{7}$

f) None of the above.

$$\sin(x-y) = \sin x \cos y - \cos x \sin y$$
$$= \left(\frac{3}{4}\right)\left(\frac{-\sqrt{5}}{3}\right) - \left(\frac{-\sqrt{7}}{4}\right)\left(\frac{-2}{3}\right)$$
$$= \frac{-\sqrt{5}}{4} - \frac{\sqrt{7}}{6}$$

Question 20

Your answer is CORRECT.

$$\cos(\alpha+\beta) = \cos\alpha\cos\beta - \sin\alpha\sin\beta$$

Find cos($^{5\pi}/_{12}$) using the sum or difference formulas.

a) $\frac{1}{3}\sqrt{3}$

b) $\frac{1}{2}\sqrt{2}$

c) $\frac{\sqrt{6}-\sqrt{2}}{(4)}$

d) $\frac{\sqrt{6}+\sqrt{2}}{(4)}$

e) $\frac{1}{2}\sqrt{6}$

f) None of the above.

$$\cos\left(\frac{3\pi}{12} + \frac{2\pi}{12}\right) = \cos\left(\frac{\pi}{4} + \frac{\pi}{6}\right)$$
$$= \cos\left(\frac{\pi}{4}\right)\cos\left(\frac{\pi}{6}\right) - \sin\left(\frac{\pi}{4}\right)\sin\left(\frac{\pi}{6}\right)$$
$$= \left(\frac{\sqrt{2}}{2}\right)\left(\frac{\sqrt{3}}{2}\right) - \left(\frac{\sqrt{2}}{2}\right)\left(\frac{1}{2}\right)$$
$$= \frac{\sqrt{6}}{4} - \frac{\sqrt{2}}{4} = \frac{\sqrt{6}-\sqrt{2}}{4}$$