Pre Calc WS #7.2 Name: _____

Write each expression in terms of the cosine and sine of one angle.

1.) $\cos 85° \cos 30° + \sin 85° \sin 30°$

$\cos 55°$

2.) $\cos\frac{7\pi}{11}\cos\frac{2\pi}{11} - \sin\frac{7\pi}{11}\sin\frac{2\pi}{11}$

$\cos 9\pi/11$

3.) $\sin 105°\cos 85° - \cos 105° \sin 85°$

$\sin 20°$

4.) $\sin 100° \cos 12° + \cos 100° \sin 12°$

$\sin 112°$

5.) $\dfrac{\tan 17° + \tan 28°}{1 - \tan 17° \tan 28°}$ $\tan 45°$

Use the sum or difference identity for the cosine or sine to find the exact value of each trigonometric function. Show all your work. No work no credit.

6.) $\sin 375°$

$\sin(150° + 225°)$

sin cos + cos sin

$\dfrac{\sqrt{6}-\sqrt{2}}{4}$

7.) $\sin 255°$

$\sin(45+210)$

$\dfrac{-\sqrt{2}-\sqrt{6}}{4}$

8.) $\cos 195°$

$\cos(150+45)$

coscos − sinsin

$-\dfrac{\sqrt{6}-\sqrt{2}}{4}$

9.) $\cos -\dfrac{5\pi}{12}$ $\pi/3 - 3\pi/4$ or $\cos(-\pi/6 + \pi/4)$

$\dfrac{\sqrt{6}-\sqrt{2}}{4}$

10.) $\sin\dfrac{\pi}{12}$

$\sin(\pi/3 - \pi/4)$

$\dfrac{\sqrt{6}-\sqrt{2}}{4}$

11.) $\tan\dfrac{19}{12}\pi$

$\tan(5\pi/4 + \pi/3)$

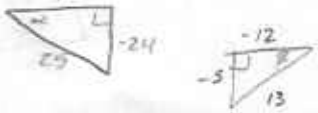
$\dfrac{\tan + \tan}{1 - \tan\tan} = -2-\sqrt{3}$

12.) Find the exact value of $\cos(\alpha+\beta)$ if $\cos\alpha = \dfrac{7}{25}$, $\sin\beta = -\dfrac{5}{13}$, $270° < \alpha < 360°$, and $180° < \beta < 270°$.

$\cos\alpha\cos\beta - \sin\alpha\sin\beta$

$\frac{7}{25}\cdot\frac{-12}{13} - \frac{-24}{25}\cdot\frac{-5}{13}$

$-204/325$



13.) Find the exact value of $\cos(\alpha - \beta)$ if $\cos\alpha = -\frac{7}{25}$, $\tan\beta = -\frac{3}{4}$, $180° < \alpha < 270°$, and $90° < \beta < 180°$.

$\cos\alpha\cos\beta + \sin\alpha\sin\beta$

$-\frac{7}{25} \cdot -\frac{4}{5} + -\frac{24}{25} \cdot \frac{3}{5}$

$\boxed{-\frac{44}{125}}$

14.) Find the exact value of $\sin(\alpha - \beta)$ if $\cos\alpha = \frac{7}{25}$, $\sin\beta = \frac{5}{13}$, $270° < \alpha < 360°$, and $0° < \beta < 90°$.

$\sin\alpha\cos\beta - \cos\alpha\sin\beta$

$-\frac{24}{25} \cdot \frac{12}{13} - \frac{7}{25} \cdot \frac{5}{13}$

$\boxed{-\frac{323}{325}}$

15.) Find the exact value of $\sin(\alpha + \beta)$ if $\cos\alpha = \frac{15}{17}$, $\tan\beta = \frac{4}{3}$, $270° < \alpha < 360°$, and $180° < \beta < 270°$.

$\sin\alpha\cos\beta + \cos\alpha\sin\beta$

$-\frac{8}{17} \cdot -\frac{3}{5} + \frac{15}{17} \cdot -\frac{4}{5} = \boxed{-\frac{36}{85}}$

16.) Prove: $\csc\left(\frac{3\pi}{2} + \beta\right) = -\sec\beta$

$\frac{1}{\sin(3\pi/2 + \beta)}$

$\frac{1}{-1\sin 3\pi/2\cos\beta + \cos 3\pi/2\sin\beta}$

$\frac{1}{-\cos\beta} = -\sec\beta$

17.) Prove: $\sec(180° + \alpha) = -\sec\alpha$

$\frac{1}{-1\cos 180°\cos\alpha - \sin 180°\sin\alpha}$

$\frac{1}{-\cos\alpha} = -\sec\alpha$

18.) Prove: $\tan x + \cot y = \frac{\cos(x-y)}{\cos x \sin y}$

$\frac{\cos x\cos y + \sin x\sin y}{\cos x\sin y \quad \cos x\sin y}$

$\cot y + \tan x$

✓

Write each expression in terms of the cosine and sine of one angle.

19.) $\cos 85° \cos 30° - \sin 85° \sin 30°$

$\cos 115°$

20.) $\cos\frac{7\pi}{11}\cos\frac{2\pi}{11} + \sin\frac{7\pi}{11}\sin\frac{2\pi}{11}$

$\cos 5\pi/11$

21.) $\sin 65°\cos 95° + \cos 65° \sin 95°$

$\sin 160°$

22.) $\sin 42° \cos 12° - \cos 42° \sin 12°$

$\sin 30°$

23.) $\frac{\tan 17° - \tan 28°}{1 + \tan 17° \tan 28°} = \tan(-11°)$

Use the sum or difference identity for the cosine, sine, or tangent to find the exact value of each trigonometric function. Show all your work. No work no credit.

24.) $\sin 105°$

$\sin(45°+60°)$

$\frac{\sqrt{2}+\sqrt{6}}{4}$

25.) $\sin 285°$ $225+60$

$\frac{-\sqrt{2}-\sqrt{6}}{4}$

26.) $\tan 195°$ $150°+45°$

$2-\sqrt{3}$

27.) $\cos\frac{5\pi}{12}$ $\pi/6+\pi/4$

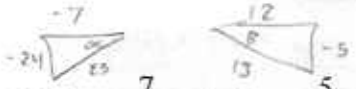
$\frac{\sqrt{6}-\sqrt{2}}{4}$

28.) $\tan -\frac{7\pi}{12}$ $-\pi/3 - \pi/4$ or $4\pi/3 - 3\pi/4$

$2+\sqrt{3}$

29.) $\sin\frac{19}{12}\pi$ $4\pi/3+\pi/4$

$\frac{-\sqrt{2}-\sqrt{6}}{4}$

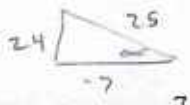


30.) Find the exact value of $\sin(\alpha+\beta)$ if $\cos\alpha = -\frac{7}{25}$, $\sin\beta = -\frac{5}{13}$, $180° < \alpha < 270°$, and $270° < \beta < 360°$.

$\sin\alpha\cos\beta + \cos\alpha\sin\beta$

$-24/25 \cdot 12/13 + -7/25 \cdot 5/13$

$\frac{-253}{325}$

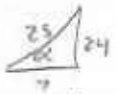


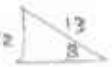
31.) Find the exact value of $\sin(\alpha - \beta)$ if $\cos\alpha = -\frac{7}{25}$, $\tan\beta = -\frac{4}{3}$, $90° < \alpha < 180°$, and $270° < \beta < 360°$.

$\sin\alpha\cos\beta - \cos\alpha\sin\beta$

$24/25 \cdot 3/5 - -7/25 \cdot -4/5$

$\boxed{44/125}$





32.) Find the exact value of $\cos(\alpha - \beta)$ if $\cos\alpha = \frac{7}{25}$, $\sin\beta = \frac{12}{13}$, $0° < \alpha < 90°$, and $90° < \beta < 180°$.

$\cos\alpha\cos\beta + \sin\alpha\sin\beta$

$7/25 \cdot -5/13 + 24/25 \cdot 12/13$

$\boxed{253/325}$

33.) Find the exact value of $\cos(\alpha + \beta)$ if $\cos\alpha = -\frac{15}{17}$, $\cot\beta = -\frac{3}{4}$, $180° < \alpha < 270°$, and $90° < \beta < 180°$.

$\cos\alpha\cos\beta - \sin\alpha\sin\beta$

$-15/17 \cdot -3/5 - -8/17 \cdot 4/5$

$\boxed{77/85}$

34.) Prove: $\cos\left(\frac{3\pi}{2} - \beta\right) = -\sin\beta$

$\cos 3\pi/2\cos\beta + \sin 3\pi/2\sin\beta$ ($\cos 3\pi/2 = 0$, $\sin 3\pi/2 = -1$)

$-\sin\beta$ ✓

35.) Prove: $\cos(90° - \alpha) = \sin\alpha$

$\cos 90\cos\alpha + \sin 90\sin\alpha$ ($\cos 90 = 0$, $\sin 90 = 1$)

$\sin\alpha$

✓

36.) Prove: $\tan x + \tan y = \frac{\sin(x+y)}{\cos x\cos y}$

$\frac{\sin x\cos y}{\cos x\cos y} + \frac{\cos x\sin y}{\cos x\cos y}$

✓ $\tan x + \tan y$