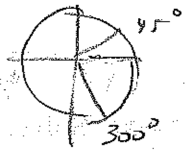
Honors Algebra 3-4 Name Key

5.4-5.5 Worksheet Period ______

Show all supporting work. All answers must be **exact**, but you may use calculator to check.

Sum and difference formulas:



(Hint: $105° = 60° + 45°$)

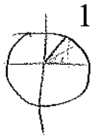
1. $\sin 105° = \sin(60+45) = \sin 60\cos 45 + \cos 60 \sin 45$
   $= \left(\frac{\sqrt{3}}{2}\right)\left(\frac{\sqrt{2}}{2}\right) + \left(\frac{1}{2}\right)\left(\frac{\sqrt{2}}{2}\right) = \frac{\sqrt{6}+\sqrt{2}}{4}$

   $\cos 105° = \cos 60\cos 45 - \sin 60 \sin 45$
   $= \left(\frac{1}{2}\right)\left(\frac{\sqrt{2}}{2}\right) - \left(\frac{\sqrt{3}}{2}\right)\left(\frac{\sqrt{2}}{2}\right) = \frac{\sqrt{2}-\sqrt{6}}{4}$

   $\tan 105° = \frac{\tan 60 + \tan 45}{1 - \tan 60 \tan 45} = \frac{\sqrt{3}+1}{1-\sqrt{3}}$

   $\tan 60 = \frac{\sqrt{3}/2}{1/2} = \sqrt{3}$

   $\tan 45 = 1$



(Hint: $\cancel{225}\ 255° = 300° - 45°$)

2. $\sin \cancel{225}\ 255° = \sin 300 \cos 45 - \cos 300 \sin 45$
   $= \left(\frac{-\sqrt{3}}{2}\right)\left(\frac{\sqrt{2}}{2}\right) - \left(\frac{1}{2}\right)\left(\frac{\sqrt{2}}{2}\right) = \frac{-\sqrt{6}-\sqrt{2}}{4}$

   $\cos \cancel{225}\ 255° = \cos 300 \cos 45 + \sin 300 \sin 45$
   $= \left(\frac{1}{2}\right)\left(\frac{\sqrt{2}}{2}\right) + \left(\frac{-\sqrt{3}}{2}\right)\left(\frac{\sqrt{2}}{2}\right) = \frac{\sqrt{2}-\sqrt{6}}{4}$

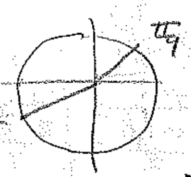
   $\tan \cancel{225}\ 255° = \frac{\tan 300 - \tan 45}{1 + \tan 300 \tan 45} = \frac{-\sqrt{3}-1}{1-\sqrt{3}}$

   $\tan 300° = \frac{-\sqrt{3}/2}{1/2} = -\sqrt{3}$

   $\tan 45° = 1$

3. $\cos 32° \cos 15° - \sin 32° \sin 15° = \cos(32° + 15°) = \cos(47°)$

4. $\frac{\tan 212° - \tan 84°}{1 + \tan 212° \tan 84°} = \tan(212 - 84) = \tan 128°$



5. (Hint: $\frac{17\pi}{12} = \frac{7\pi}{6} + \frac{\pi}{4}$)

   $\sin\frac{17\pi}{12} = \sin\frac{7\pi}{6}\cos\frac{\pi}{4} + \cos\frac{7\pi}{6}\sin\frac{\pi}{4}$
   $= \left(-\frac{1}{2}\right)\left(\frac{\sqrt{2}}{2}\right) + \left(\frac{-\sqrt{3}}{2}\right)\left(\frac{\sqrt{2}}{2}\right) = \frac{-\sqrt{2}-\sqrt{6}}{4}$

   $\tan\frac{7\pi}{6} = \frac{-1/2}{-\sqrt{3}/2} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{2}$

   $\tan\frac{\pi}{4} = 1$

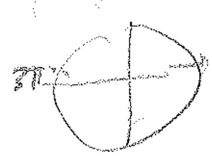
   $\cos\frac{17\pi}{12} = \cos\frac{7\pi}{6}\cos\frac{\pi}{4} - \sin\frac{7\pi}{6}\sin\frac{\pi}{4}$
   $= \left(-\frac{\sqrt{3}}{2}\right)\left(\frac{\sqrt{2}}{2}\right) - \left(-\frac{1}{2}\right)\left(\frac{\sqrt{2}}{2}\right) = \frac{-\sqrt{6}+\sqrt{2}}{4}$

   $\tan\frac{17\pi}{12} = \frac{\tan\frac{7\pi}{6} + \tan\frac{\pi}{4}}{1 - \tan\frac{7\pi}{6}\tan\frac{\pi}{4}} = \frac{\frac{\sqrt{3}}{2}+1}{1-\frac{\sqrt{3}}{2}(1)} = \frac{\sqrt{3}+2}{2-\sqrt{3}}$

6. $\sin 5\theta \cos 4\theta - \cos 5\theta \sin 4\theta = \sin(5\theta - 4\theta)$

7. Verify: $\sin(3\pi - x) = \sin x$

   $\sin 3\pi \cos x - \cos 3\pi \sin x = \sin x$
   $(0)\cos x - (-1)\sin x = \sin x$
   $\sin x = \sin x$ ✓



Double Angles:

8. Solve: $\cos 2x + \sin x = 0$

$1 - 2\sin^2 x + \sin x = 0$

$-2\sin^2 x + \sin x + 1 = 0$

$2\sin^2 x - \sin x - 1 = 0$

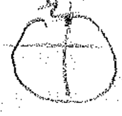
$\frac{(2\sin x - 2)}{2}\frac{(2\sin x + 1)}{1}$

$m: -2 \mid a: -1$; $-2+1$

$(\sin x - 1)(2\sin x + 1) = 0$

$\sin x - 1 = 0$ $\quad$ $2\sin x + 1 = 0$

$\sin x = 1$ $\quad$ $\sin x = -\frac{1}{2}$

$\frac{\pi}{2}$  $\boxed{\frac{\pi}{2}}$

$\frac{7\pi}{6}$, $\frac{11\pi}{6}$ $\quad$ $\boxed{\frac{7\pi}{6}, \frac{11\pi}{6}}$

9. Solve: $\sin 2x + \cos x = 0$

$2\sin x \cos x + \cos x = 0$

$\cos x(2\sin x + 1) = 0$

$\cos x = 0$  $\boxed{\frac{\pi}{2}, \frac{3\pi}{2}}$

$2\sin x + 1 = 0$

$\sin x = -\frac{1}{2}$

$\frac{7\pi}{6}$, $\frac{11\pi}{6}$ $\quad$ $\boxed{\frac{7\pi}{6}, \frac{11\pi}{6}}$

10. Given: $\cos\theta = -\frac{2}{3}, \frac{x}{r}$ *and* $\frac{\pi}{2} < x < \pi$

Find: $\sin 2\theta = 2\sin\theta\cos\theta = 2\frac{\sqrt{5}}{3}\left(-\frac{2}{3}\right) = -\frac{4\sqrt{5}}{9}$

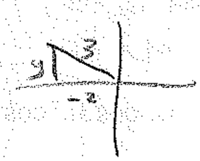
$\cos 2\theta = \cos^2\theta - \sin^2\theta = \frac{4}{9} - \frac{5}{9} = -\frac{1}{9}$

$y^2 + 4 = 9$

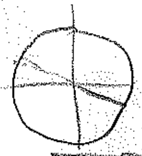
$y^2 = 5$

$y = \sqrt{5}$

$\sin\theta = \frac{\sqrt{5}}{3}$



Half Angles:

(Hint: $165° = \frac{330°}{2}$) 

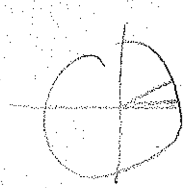
(Hint: $22.5° = \frac{45°}{2}$) 

11. $\sin 165° = \pm\sqrt{\frac{1-\cos 330°}{2}} = \sqrt{\frac{1-\frac{\sqrt{3}}{2}}{2}} = \sqrt{\frac{2-\sqrt{3}}{4}}$

$\cos 165° = \pm\sqrt{\frac{1+\cos 330°}{2}} = -\sqrt{\frac{1+\frac{\sqrt{3}}{2}}{2}} = -\sqrt{\frac{2+\sqrt{3}}{4}}$

12. $\sin 22.5° = \pm\sqrt{\frac{1-\cos 45°}{2}} = \sqrt{\frac{1-\frac{\sqrt{2}}{2}}{2}} = \sqrt{\frac{2-\sqrt{2}}{4}}$

$\cos 22.5° = \pm\sqrt{\frac{1+\cos 45°}{2}} = \sqrt{\frac{1+\frac{\sqrt{2}}{2}}{2}} = \sqrt{\frac{2+\sqrt{2}}{4}}$

(Hint: $\frac{\pi}{12} = \frac{\left(\frac{\pi}{6}\right)}{2}$) 

13. $\sin\frac{\pi}{12} = \pm\sqrt{\frac{1-\cos\frac{\pi}{6}}{2}} = \sqrt{\frac{1-\frac{\sqrt{3}}{2}}{2}} = \sqrt{\frac{2-\sqrt{3}}{4}}$

$\cos\frac{\pi}{12} = \pm\sqrt{\frac{1+\cos\frac{\pi}{6}}{2}} = \sqrt{\frac{1+\frac{\sqrt{3}}{2}}{2}} = \sqrt{\frac{2+\sqrt{3}}{4}}$

Honors Algebra 3-4 Name________________________________
5.4-5.5 Worksheet Period ______

Show all supporting work. All answers must be **exact**, but you may use calculator to check.

Sum and difference formulas:

(Hint: $105° = 60° + 45°$)
1. $\sin 105° =$

   $\cos 105° =$

   $\tan 105° =$

(Hint: $225° = 300° - 45°$)
2. $\sin 225° =$

   $\cos 225° =$

   $\tan 225° =$

3. $\cos 32° \cos 15° - \sin 32° \sin 15° =$

4. $\dfrac{\tan 212° - \tan 84°}{1 + \tan 212° \tan 84°} =$

5. (Hint: $\dfrac{17\pi}{12} = \dfrac{7\pi}{6} + \dfrac{\pi}{4}$)

   $\sin \dfrac{17\pi}{12} =$

   $\cos \dfrac{17\pi}{12} =$

   $\tan \dfrac{17\pi}{12} =$

6. $\sin 5\theta \cos 4\theta - \cos 5\theta \sin 4\theta =$

7. Verify: $\sin(3\pi - x) = \sin x$

Double Angles:

8. Solve: $\cos 2x + \sin x = 0$

9. Solve: $\sin 2x + \cos x = 0$

10. Given: $\cos\theta = -\frac{2}{3}, \quad and \quad \frac{\pi}{2} < x < \pi$

Find: $\sin 2\theta$

$\cos 2\theta$

Half Angles:

(Hint: $165° = \frac{330°}{2}$)

11. $\sin 165° =$

$\cos 165° =$

(Hint: $22.5° = \frac{45°}{2}$)

12. $\sin 22.5° =$

$\cos 22.5° =$

(Hint: $\frac{\pi}{12} = \frac{\left(\frac{\pi}{6}\right)}{2}$)

13. $\sin\frac{\pi}{12} =$

$\cos\frac{\pi}{12} =$

Honors Algebra 3-4
Ch. 5 Review Worksheet

Name________________________________

Period ______

(Do work on separate sheets of paper)

1. Simplify: $\sec x \cos\left(\frac{\pi}{2} - x\right)$

2. Simplify: $\frac{\csc x}{\tan x + \cot x}$

3. Perform the addition and simplify:

   $\frac{\tan x}{\csc x} + \frac{\sin x}{\tan x}$

4. Simplify: $\frac{\sin^2 x}{\sec^2 x - 1}$

5. Simplify: $\frac{1}{\cot\theta} + \frac{1}{\tan\theta}$

6. Factor and simplify:

   $\sec^2 x \csc^2 x - \sec^2 x - \csc^2 x + 1$

7. Factor and simplify: $\cot^4 x + 2\cot^2 x + 1$

8. Rewrite the expression so that it is not in fractional form: $\frac{\cos^2 x}{1 - \sin x}$

9. Use the substitution $x = 3\cos\theta$ to write the algebraic expression $\sqrt{9 - x^2}$ as a trigonometric expression involving θ, where $0 < \theta < \frac{\pi}{2}$

10. Verify the identity: $\frac{\sec x - \cos x}{\tan x} = \sin x$

11. Verify the identity: $\frac{\csc x}{\sin x} - \frac{\cot x}{\tan x} = 1$

12. Verify the identity: $\dfrac{1+\tan x}{\sin x}-\sec x=\csc x$

13. Verify the identity: $\sin\left(\dfrac{\pi}{2}-x\right)\cos(-x)=\cos^2 x$

14. Verify the identity: $\dfrac{\cos x}{1-\sin^2 x}=\sec x$

15. Verify the identity: $1+\dfrac{1}{\csc^2 x-1}=\sec^2 x$

16. Find all the solutions in the interval $[0,2\pi)$: $\tan 3t=\sqrt{3}$

17. Find all the solutions in the interval $[0,2\pi)$: $\sec^2 x=\sec x+2$

18. Find all the solutions in the interval $[0,2\pi)$: $\cot^2 x-\tan^2 x=0$

19. Find all the solutions in the interval $[0,2\pi)$: $2\sin x\cos x+\cos x=0$

20. Given $\sin x=\dfrac{3}{10}$ *and* $\cos x=-\dfrac{\sqrt{91}}{10}$, find $\tan x$. (Draw the diagrams)

21. Evaluate: $\sin 105°$. (Use the fact that $105°=60°+45°$)

22. Evaluate: $\tan 165°$. (Use the fact that $165°=210°-45°$)

23. Evaluate: $\cos 285°$. (Use the fact that $285°=330°-45°$)

24. Simplify: $\sin 8x\cos 2x+\cos 8x\sin 2x$ (sum & difference formulas)

25. Given $\sin u=-\dfrac{5}{13}, 0<u<\dfrac{3\pi}{2}$ *and* $\csc v=\dfrac{\sqrt{10}}{3}, \dfrac{\pi}{2}<v<\pi$, find $\cos(u-v)$. (Draw the diagrams)

26. Find all solutions in the interval $[0,2\pi)$: $\cos 2x+\sin x=0$

~~Cots~~ Review worksheet

(1) $\sec x \cos(\frac{\pi}{2}-x)$

$\sec x \sin x$

$\frac{1}{\cos x} \sin x$

$\boxed{\tan x}$

(2) $\frac{\csc x}{\tan x+\cot x}$

$\frac{\frac{1}{\sin x}}{\frac{\sin x}{\cos x}+\frac{\cos x}{\sin x}}$

$\frac{1}{\frac{\sin^2 x}{\cos x}+\cos x}$

$\frac{\cos x}{\sin^2 x+\cos^2 x}$

$\frac{\cos x}{1}$

$\boxed{\cos x}$

(3) $\frac{\tan x}{\csc x}+\frac{\sin x}{\tan x}$

$\frac{\tan^2 x+\sin x\csc x}{\tan x\csc x}$

$\frac{\tan^2 x+1}{\tan x \csc x}$

$\frac{\sec^2 x}{\tan x\csc x}$

$\frac{1}{\cos^2 x}\frac{\cos x}{\sin x}\frac{\sin x}{1}$

$\frac{1}{\cos x}$

$\boxed{\sec x}$

(4) $\frac{\sin^2 x}{\sec^2 x-1}$

$\frac{\sin^2 x}{\tan^2 x} \to \sin^2 x\cot^2\theta$

$\sin^2 x \frac{\cos^2 x}{\sin^2 x}$

$\boxed{\cos^2 x}$

(5) $\frac{1}{\cot\theta}+\frac{1}{\tan\theta}$

$\frac{\tan\theta+\cot\theta}{\cot\theta\tan\theta}$

$\boxed{\tan\theta+\cot\theta}$

(6) $\sec^2 x\csc^2 x-\sec^2 x-\csc^2 x+1$

$\sec^2 x(\csc^2 x-1)-(\csc^2 x-1)$

$(\csc^2 x-1)(\sec^2 x-1)$

$\cot^2 x\tan^2 x$

$\frac{\tan^2 x}{\tan^2 x}$

$\boxed{1}$

(7) $\cot^4 x+2\cot^2 x+1$

$u=\cot^2 x$

u^2+2u+1

$(u+1)(u+1)$

$(\cot^2 x+1)(\cot^2 x+1)$

$\csc^2 x\csc^2 x$

$\boxed{\csc^4 x}$

(8) $\frac{\cos^2 x}{1-\sin x}$

$\frac{\cos^2 x(1+\sin x)}{(1-\sin x)(1+\sin x)}$

$\frac{\cos^2 x(1+\sin x)}{1-\sin^2 x}$

$\frac{\cos^2 x(1+\sin x)}{\cos^2 x}$

$\boxed{1+\sin x}$

(9) sub $x=3\cos\theta$, $\sqrt{9-x^2}$

$\sqrt{9-(3\cos\theta)^2}$

$\sqrt{9-9\cos^2\theta}$

$\sqrt{9(1-\cos^2\theta)}$

$\sqrt{9\sin^2\theta}$

$\boxed{3\sin\theta}$

(10) $\dfrac{\sec x - \cos x}{\tan x} = \sin x$

$\dfrac{\sec x}{\tan x} - \dfrac{\cos x}{\tan x} = \sin x$

$\dfrac{1}{\cos x}\dfrac{\cos x}{\sin x} - \dfrac{\cos x \cos x}{\sin x} = \sin x$

$\dfrac{1}{\sin x} - \dfrac{\cos^2 x}{\sin x} = \sin x$

$\dfrac{\sin^2 x}{\sin x} = \sin x$

$\sin x = \sin x$ ✓

(11) $\dfrac{\csc x}{\sin x} - \dfrac{\cot x}{\tan x} = 1$

$\dfrac{1}{\sin^2 x} - \dfrac{\cos x \cos x}{\sin x \sin x} = 1$

$\dfrac{1 - \cos^2 x}{\sin^2 x} = 1$

$\dfrac{\sin^2 x}{\sin^2 x} = 1$

$1 = 1$ ✓

(12) $\dfrac{1 + \tan x}{\sin x} - \sec x = \csc x$

$\dfrac{1}{\sin x} + \dfrac{\tan x}{\sin x} - \dfrac{1}{\cos x} = \csc x$

$\dfrac{1}{\sin x} + \dfrac{\sin x}{\cos x \sin x} - \dfrac{1}{\cos x} = \csc x$

$\dfrac{1}{\sin x} + \dfrac{1}{\cos x} - \dfrac{1}{\cos x} = \csc x$

$\dfrac{1}{\sin x} = \csc x$

$\csc x = \csc x$ ✓

(13) $\sin\left(\frac{\pi}{2} - x\right)\cos(-x) = \cos^2 x$

$\cos x \cos x = \cos^2 x$

$\cos^2 x = \cos^2 x$ ✓

(14) $\dfrac{\cos x}{1 - \sin^2 x} = \sec x$

$\dfrac{\cos x}{\cos^2 x} = \sec x$

$\dfrac{1}{\cos x} = \sec x$

$\sec x = \sec x$ ✓

(15) $1 + \dfrac{1}{\csc^2 x - 1} = \sec^2 x$

$\dfrac{\csc^2 x - 1 + 1}{\csc^2 x - 1} = \sec^2 x$

$\dfrac{\csc^2 x}{\csc^2 x - 1} = \sec^2 x$

$\dfrac{\csc^2 x}{\cot^2 x} = \sec^2 x$

$\dfrac{1}{\sin^2 x}\dfrac{\sin^2 x}{\cos^2 x} = \sec^2 x$

$\dfrac{1}{\cos^2 x} = \sec^2 x$

$\sec^2 x = \sec^2 x$ ✓

(16) $\tan 3t = \dfrac{\sqrt{3}/2}{1/2}$ ← sin ← cos

$3t = \frac{\pi}{3}$ $\quad t = \boxed{\frac{\pi}{9}}$

$3t = \frac{4\pi}{3}$ $\quad t = \boxed{\frac{4\pi}{9}}$

$\frac{\pi}{3}$ $\quad \frac{4\pi}{3}$

(17) $\sec^2 x = \sec x + 2$

$\sec^2 x - \sec x - 2 = 0$

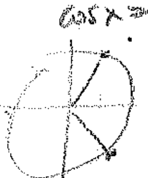
$u^2 - u - 2 = 0$

$(u-2)(u+1)$

$(\sec x - 2)(\sec x + 1) = 0$

$\sec x = 2$ $\quad \sec x = -1$

$\cos x = \frac{1}{2}$ $\quad \cos x = 1$



$\boxed{\frac{\pi}{3}, \frac{5\pi}{3}}$ $\quad \boxed{\pi}$

(18) $\cot^2 x - \tan^2 x = 0$

$\dfrac{1}{\tan^2 x} - \tan^2 x = 0$

$\tan^2 x - \tan^4 x = 0$

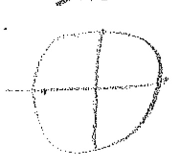
$\tan^4 x - \tan^2 x = 0$

$\tan^2 x(\tan^2 x - 1) = 0$

$\tan^2 x = 0$ $\quad \tan^2 x = 1$

$\sin^2 x = 0$ $\quad \tan x = 1$

$\sin x = 0$ $\quad \sin x = \cos x$



$0, \pi$ $\quad \frac{\pi}{4}$ $\quad \frac{5\pi}{4}$

$\boxed{0, \pi, \frac{\pi}{4}, \frac{5\pi}{4}}$

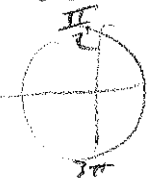
(19) $2\sin x \cos x + \cos x = 0$

$\cos x(2\sin x + 1) = 0$

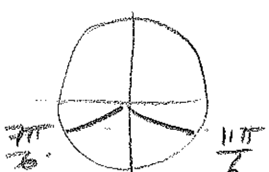
$\cos x = 0$ $\quad 2\sin x + 1 = 0$

$2\sin x = -1$

$\sin x = \frac{-1}{2}$



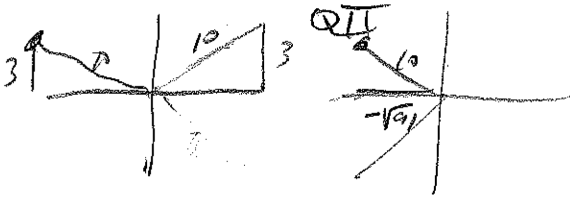
$\frac{\pi}{2}$ $\quad \frac{3\pi}{2}$



$\frac{7\pi}{6}$ $\quad \frac{11\pi}{6}$

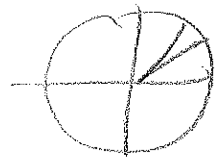
$\boxed{\frac{\pi}{2}, \frac{3\pi}{2}, \frac{7\pi}{6}, \frac{11\pi}{6}}$

(20) $\sin x = \frac{3}{10}$, $\cos x = \frac{-\sqrt{91}}{10}$ find $\tan x$



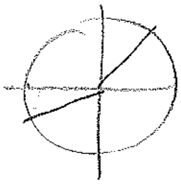
$\tan x = \frac{\sin x}{\cos x} = \frac{3/10}{-\sqrt{91}/10} = \frac{-3}{\sqrt{91}} = \boxed{\frac{-3\sqrt{91}}{91}}$

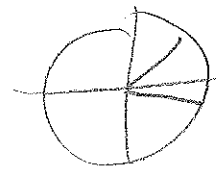
(21) $\sin 105° = \sin(60° + 45°) = \sin 60 \cos 45 + \cos 60 \sin 45$
$= \left(\frac{\sqrt{3}}{2}\right)\left(\frac{\sqrt{2}}{2}\right) + \left(\frac{1}{2}\right)\left(\frac{\sqrt{2}}{2}\right)$
$= \boxed{\frac{\sqrt{6}+\sqrt{2}}{4}}$



(22) $\tan 165° = \tan(210 - 45°) = \frac{\tan 210 - \tan 45}{1 + \tan 210 \tan 45}$
$= \frac{-\frac{1}{\sqrt{3}} - 1}{1 + -\frac{1}{\sqrt{3}}} = \boxed{\frac{-1-\sqrt{3}}{\sqrt{3}-1}}$

$\tan 210 = \frac{-1/2}{\sqrt{3}/2}$
$= -\frac{1}{\sqrt{3}}$
$\tan 45 = 1$



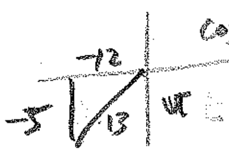


(23) $\cos 285° = \cos(330 - 45) = \cos 330 \cos 45 + \sin 330 \sin 45$
$= \left(\frac{\sqrt{3}}{2}\right)\left(\frac{\sqrt{2}}{2}\right) + \left(\frac{-1}{2}\right)\left(\frac{\sqrt{2}}{2}\right)$
$= \boxed{\frac{\sqrt{6}-\sqrt{2}}{4}}$

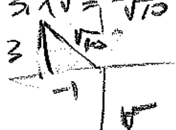
(24) $\sin 8x \cos 2x + \cos 8x \sin 2x = \sin(8x + 2x) = \boxed{\sin 10x}$

(25) $\sin u = \frac{-5}{13}$ $0 < u < \frac{3\pi}{2}$ $\csc v = \frac{\sqrt{10}}{3}$ $\frac{\pi}{2} < v < \pi$ find $\cos(u - v)$

$\cos u = \frac{-12}{13}$



$\sin v = \frac{3}{\sqrt{10}}$



$\cos v = \frac{-1}{\sqrt{10}}$

$3^2 + x^2 = 10$
$9 + x^2 = 10$
$x^2 = 1$
$x = 1$

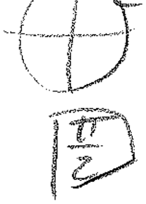
$\cos(u - v) = \cos u \cos v + \sin u \sin v$
$= \left(\frac{-12}{13}\right)\left(\frac{-1}{\sqrt{10}}\right) + \left(\frac{-5}{13}\right)\left(\frac{3}{\sqrt{10}}\right) = \frac{12 - 8}{13\sqrt{10}} = \frac{4\sqrt{10}}{130} = \boxed{\frac{2\sqrt{10}}{65}}$

(26) $\cos 2x + \sin x = 0$
$1 - 2\sin^2 x + \sin x = 0$
$-2\sin^2 x + \sin x + 1 = 0$
$2\sin^2 x - \sin x - 1 = 0$
$2u^2 - u - 1$

$\begin{array}{c|c} \frac{u}{-2} & 9 \\ & -1 \\ & -2+1 \end{array}$

$\left(\frac{2u-2}{2}\right)\left(\frac{2u+1}{1}\right)$
$(u-1)(2u+1)$
$(\sin x - 1)(2\sin x + 1) = 0$

$\sin x - 1 = 0$
$\sin x = 1$



$\boxed{\frac{\pi}{2}}$

$2\sin x + 1 = 0$
$2\sin x = -1$
$\sin x = -\frac{1}{2}$

$\boxed{\frac{7\pi}{6}, \frac{11\pi}{6}}$