Pre-Calculus TEST 3.1 Review

Name ___Key___
Period _____

I. Match the following identities.

1. $\sin(\alpha-\beta)$ **B**	6. $\tan(\alpha+\beta)$ **G**	A. $2\sin\alpha\cos\alpha$	F. $\cos\alpha\cos\beta-\sin\alpha\sin\beta$
2. $\sin(\alpha+\beta)$ **J**	7. $\cos2\alpha$ **I**	B. $\sin\alpha\cos\beta-\cos\alpha\sin\beta$	G. $\dfrac{\tan\alpha+\tan\beta}{1-\tan\alpha\tan\beta}$
3. $\cos(\alpha-\beta)$ **E**	8. $\sin2\alpha$ **A**	C. $\dfrac{2\tan\alpha}{1-\tan^2\alpha}$	H. $\dfrac{1-\cos\alpha}{\sin\alpha}$
4. $\cos(\alpha+\beta)$ **F**	9. $\tan2\alpha$ **C**	D. $\dfrac{\tan\alpha-\tan\beta}{1+\tan\alpha\tan\beta}$	I. $\cos^2\alpha-\sin^2\alpha$
5. $\tan(\alpha-\beta)$ **D**		E. $\cos\alpha\cos\beta+\sin\alpha\sin\beta$	J. $\sin\alpha\cos\beta+\cos\alpha\sin\beta$

Find the values for x where $0°\le x<360°$

10.
A. $\sin x=\dfrac{-1}{2}$ $X=210°$ $330°$

B. $\tan x=\dfrac{-1}{\sqrt3}$ $X=150°, 330°$

C. $\csc x=-1$ $\sin X=-1$ $X=270°$

D. $\sec x=-\sqrt2$ $\cos x=-\dfrac{\sqrt2}{2}$ $X=135°, 225°$

You will be allowed to use your formula sheet for this portion of the test.

$\sin A=\dfrac{3}{5}$ and $0\le A\le\dfrac{\pi}{2}$

(right triangle: hypotenuse 5, opposite 3, adjacent 4, angle A)

11. $\cos(A-B)=$
$\cos A\cos B+\sin A\sin B$
$\left(\dfrac{4}{5}\right)\left(\dfrac{-24}{25}\right)+\left(\dfrac{3}{5}\right)\left(\dfrac{2}{25}\right)$
$\dfrac{-96}{125}+\dfrac{21}{125}=\boxed{\dfrac{-75}{125}}$

12. $\sin(A+B)$
$\sin A\cos B+\cos A\sin B$
$\left(\dfrac{3}{5}\right)\left(\dfrac{-24}{25}\right)+\left(\dfrac{4}{5}\right)\left(\dfrac{7}{25}\right)$
$\dfrac{-72}{125}+\dfrac{28}{125}=\boxed{\dfrac{-44}{125}}$

$\tan B=-\dfrac{7}{24}$ and $\dfrac{\pi}{2}\le B\le\pi$

(right triangle: 25, 7, -24, angle B)

13. $\tan(A-B)$
$\dfrac{\tan A-\tan B}{1+\tan A(\tan B)}$
$\dfrac{\dfrac{3}{4}-\left(\dfrac{-7}{24}\right)}{1-\left(\dfrac{3}{4}\right)\left(\dfrac{-7}{24}\right)}=\dfrac{\dfrac{25}{24}}{1+\dfrac{21}{96}}$ $\boxed{\dfrac{100}{117}}$

14. $\sin(A-B)$
$\sin A\cos B-\cos A\sin B$
$\left(\dfrac{3}{5}\right)\left(\dfrac{-24}{25}\right)-\left(\dfrac{4}{5}\right)\left(\dfrac{7}{25}\right)$
$\dfrac{-72}{125}-\dfrac{28}{125}=\dfrac{-100}{125}=\boxed{\dfrac{-4}{5}}$

15. $\tan2A$
$\dfrac{2\tan A}{1-\tan^2A}=\dfrac{2\left(\dfrac{3}{4}\right)}{1-\dfrac{9}{16}}$
$\dfrac{\dfrac{3}{2}}{\dfrac{7}{16}}\cdot\dfrac{3}{2}\cdot\dfrac{16}{7}=\boxed{\dfrac{24}{7}}$

16. $\cos2A$
$\cos^2A-\sin^2A$
$\left(\dfrac{4}{5}\right)^2-\left(\dfrac{3}{5}\right)^2$
$\dfrac{16}{25}-\dfrac{9}{25}=\boxed{\dfrac{7}{25}}$

17. $\sin2A$
$2\sin A\cos A$
$2\left(\dfrac{3}{5}\right)\left(\dfrac{4}{5}\right)=\boxed{\dfrac{24}{25}}$

Use the sum or difference or double-angle identities to find the exact value of:

18. $\sin165°$
$\sin(120+45)$
$\sin120\cos45+\cos120\sin45$
$\left(\dfrac{\sqrt3}{2}\right)\left(\dfrac{\sqrt2}{2}\right)+\left(\dfrac{-1}{2}\right)\left(\dfrac{\sqrt2}{2}\right)$
$\boxed{\dfrac{\sqrt6-\sqrt2}{4}}$

19. $\cos75°$
$\cos(45°+30)$
$\cos45\cos30-\sin45\sin30$
$\left(\dfrac{\sqrt2}{2}\right)\left(\dfrac{\sqrt3}{2}\right)-\left(\dfrac{\sqrt2}{2}\right)\left(\dfrac{1}{2}\right)$
$\dfrac{\sqrt6-\sqrt2}{4}$

20. $\tan195°$
$\tan(150+45)$
$\dfrac{\tan150+\tan45}{1-(\tan150)(\tan45)}$
$\dfrac{-\dfrac{\sqrt3}{3}+\dfrac{\sqrt2}{2}}{1-\left(\dfrac{-\sqrt3}{3}\right)\left(\dfrac{\sqrt2}{2}\right)}=\dfrac{-\sqrt3+\sqrt2}{3}\cdot\dfrac{2}{2}$
$\boxed{\dfrac{-2\sqrt3+3\sqrt2}{6+\sqrt6}}$ $\boxed{1+\dfrac{\sqrt2}{6}}$