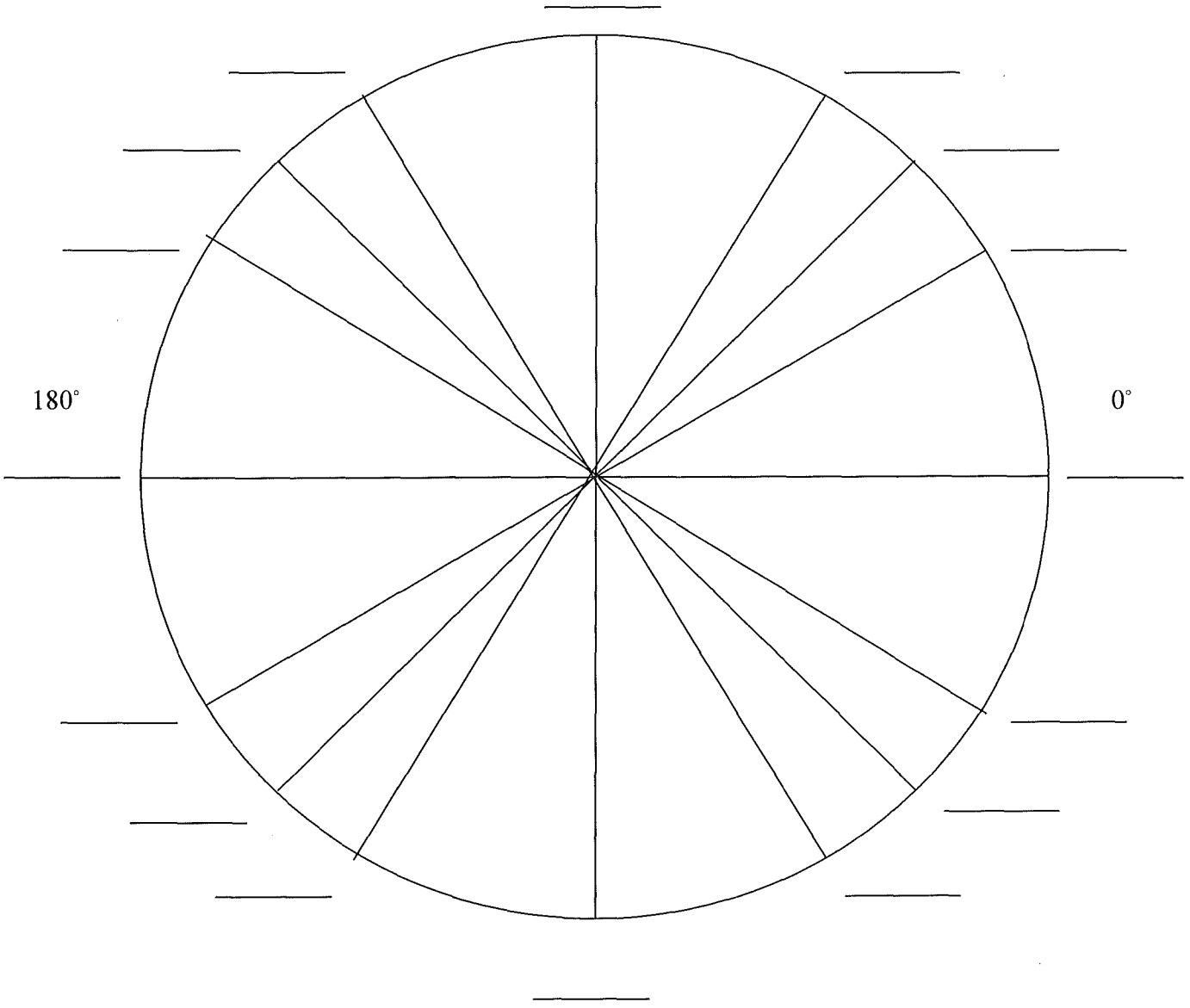
Key

Honors Algebra 2B Trimester Review

NOTE: This is intended to assist you in your final exam review preparations and not be the only tool you use in studying. This may or may not be complete and comprehensive on every topic covered in the course.

Label the indicated angles by their degree measure, radian measure and coordinates on the Unit Circle.



1. Which angle is NOT co-terminal with the others?

A. $\frac{5\pi}{6}$ B. $\frac{-19\pi}{6}$ C. 510° D. $\frac{7\pi}{6}$

2. An angle drawn in standard position has a terminal side that passes through the point $\left(-\frac{1}{2},-\frac{\sqrt{3}}{2}\right)$.

What is one possible measure of the angle? $\frac{4\pi}{3}$

3. An angle of -120° is in standard position. What are the coordinates of the point at which the terminal side intersects the unit circle? $\left(-\frac{1}{2},-\frac{\sqrt{3}}{2}\right)$

4. What is the exact value of $\cos\left(-\frac{5\pi}{4}\right)$? $-\frac{\sqrt{2}}{2}$

5. What is the exact value of $\tan\frac{2\pi}{3}$? $-\sqrt{3}$

6. Find the exact value of $\tan\left(\frac{-\pi}{6}\right)$. $-\frac{\sqrt{3}}{3}$

Find the Exact Value of each function:

7. $\cos 120^\circ - \cos\frac{\pi}{3}$ $-\frac{1}{2}-\frac{1}{2}=-1$

8. $1-(\cos 210^\circ)^2$ $1-\left(\frac{\sqrt{3}}{2}\right)^2=\frac{1}{4}$

9. If $\sec\theta=\frac{1}{\cos\theta}$, then what is: $\left(\sec\frac{5\pi}{6}\right)^2-\left(\tan\frac{5\pi}{6}\right)^2$? 1

10. If $\cot\theta=\frac{\cos\theta}{\sin\theta}$, then what is: $\cot\frac{-17\pi}{6}$? $\frac{-\frac{\sqrt{3}}{2}}{-\frac{1}{2}}=\sqrt{3}$

11. Which angle, in standard position, is NOT coterminal with the others?

A. -190° B. 170° C. 190° D. 550°

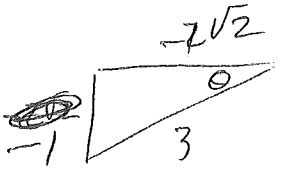
No solution

12. An angle drawn in standard position has a terminal side that passes through the point $\left(\frac{\sqrt{2}}{2},-\frac{\sqrt{2}}{2}\right)$.

What are TWO possible measures of the angle, in standard position? $-\frac{\pi}{4}$, $\frac{7\pi}{4}$

13. Given that $\cos\theta<0$, find the other five trigonometric ratios for θ.

$\sin\theta=-\frac{1}{3}$	$\csc\theta=-3$
$\cos\theta=-\frac{2\sqrt{2}}{3}$	$\sec\theta=-\frac{3\sqrt{2}}{4}$
$\tan\theta=\frac{\sqrt{2}}{4}$	$\cot\theta=2\sqrt{2}$



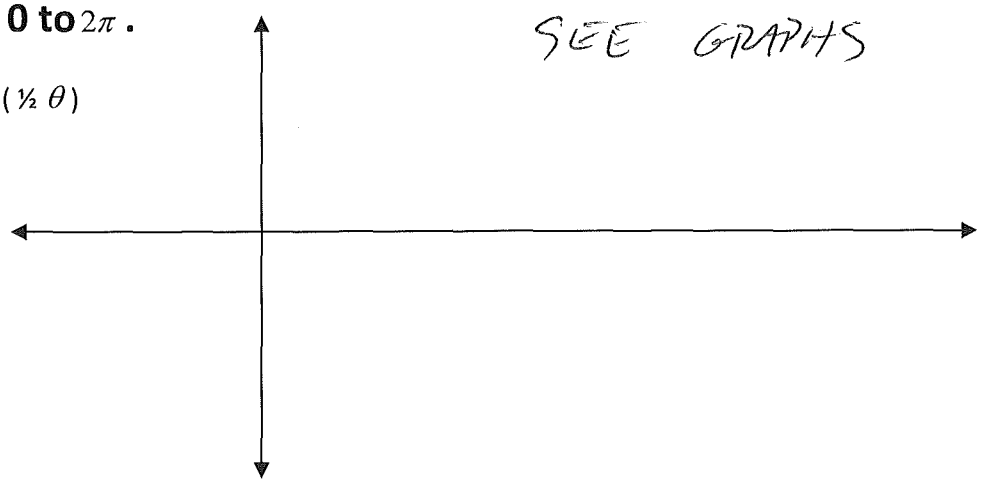
Verify. You may only work one side of the equation.

a) $\sin\theta+\cos\theta=\dfrac{\cot\theta+1}{\csc\theta}$ $\quad \frac{\cot\theta}{\csc\theta}+\frac{1}{\csc\theta} = \cos\theta+\sin\theta$

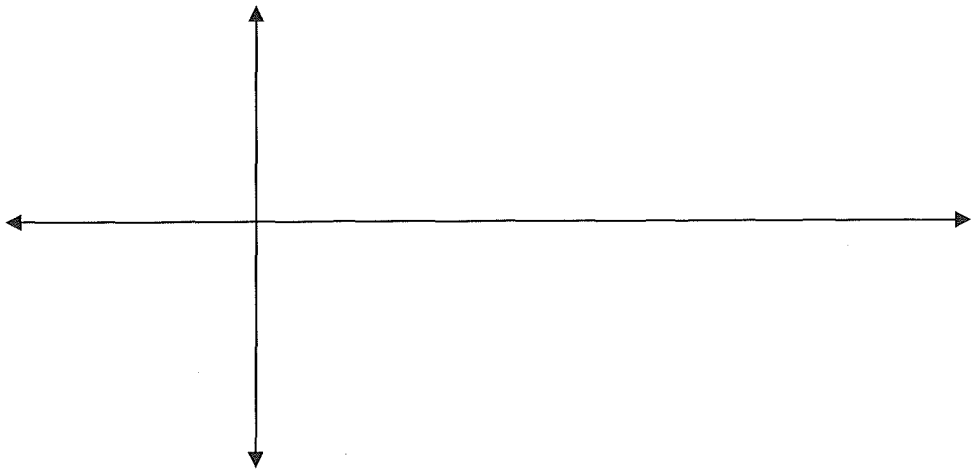
b) $(\sec\phi-\tan\phi)^2=\dfrac{1-\sin\phi}{1+\sin\phi}$

Graph from **0 to** 2π **.** SEE GRAPHS

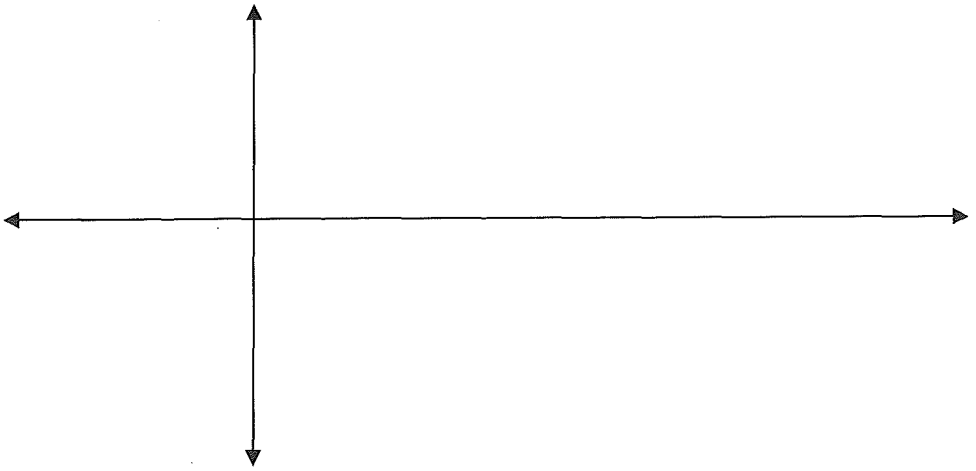
14. y = 2sin(½ θ)



15. y = tan $\left(\frac{\pi}{2}\theta\right)$



16. y = -cos 2θ



Verify the identity. Work only with the left side of the identity. SEE ATTACHED SHEET

17. $\csc x\left(\csc x-\sin x\right)+\dfrac{\sin x-\cos x}{\sin x}+\cot x=\csc^2 x$

18. $\dfrac{1+\sin x}{1-\sin x}=2\sec^2 x+2\sec x\tan x-1$

19. $\dfrac{\sec^2 x}{\cot x}-\tan^3 x=\tan x$

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

21. Find all of the exact solutions on the interval: $[0,2\pi)$.

a) $\sin\left(x+\dfrac{\pi}{4}\right)+\sin\left(x-\dfrac{\pi}{4}\right)=-1$ $x=\frac{7\pi}{4},\frac{5\pi}{4}$

b) $2-\sin^2 x=2\cos^2\dfrac{x}{2}$ $x=0,\frac{\pi}{2},\frac{3\pi}{2}$

c) $\sin 5x+\sin x=0$ USE SUM TO PRODUCT $\frac{\pi}{3},\frac{2\pi}{3},\pi,\frac{4\pi}{3},\frac{5\pi}{3},\frac{\pi}{4},\frac{3\pi}{4},\frac{5\pi}{4}$

22. Calculate the EXACT values of :

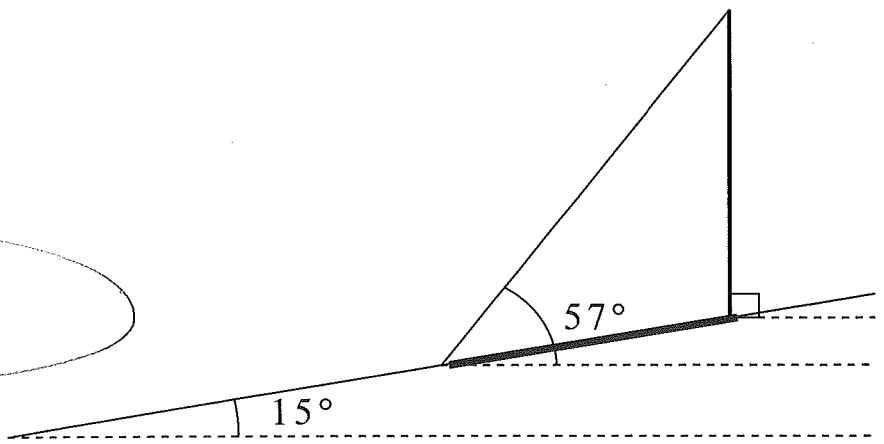
a) $\cos\dfrac{\pi}{12}$ $\sqrt{\dfrac{1+\frac{\sqrt{3}}{2}}{2}}$

b) $\cos 52.5^\circ$ $\sqrt{\dfrac{1-\sqrt{\frac{1-\frac{\sqrt{3}}{2}}{2}}}{2}}$

23. A vertical pole is at the side of a straight road that makes an angle of 15° with the horizontal. When the angle of elevation of the sun is 57°, the pole casts a shadow 75 feet long directly down the road, as shown in the figure. Approximate the length of the pole.

$\dfrac{75}{\sin 33^\circ}=\dfrac{x}{\sin 42^\circ}$

$x=92.14$ FT

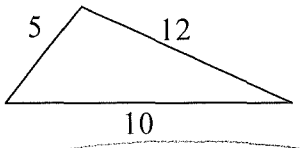


100, 95°
54, 90°
24, 15°

24. a) What is the value of all the angles?

b) Calculate the area of the triangle using the Law of Sines

c) Calculate the area of the triangle using Heron's Formula



AREA = 24,55 u²

25. Find: $\frac{z_1}{z_2}$

$Z_1 = 24(\cos \frac{5\pi}{3} + i \sin \frac{5\pi}{3})$ $Z_2 = 8(\cos 75° + i \sin 75°)$

$-\frac{3\sqrt{2}}{2} - \frac{3\sqrt{2}}{2}i$

26. Express in complex trigonometric form: $z = -3 + 4i$

$5(\cos 126.87° + i \sin 126.87°)$

27. Express in standard complex form: $4(\cos \frac{11\pi}{6} + i \sin \frac{11\pi}{6})$

$2\sqrt{3} - 2i$

28. Use DeMoivre's Theorem to find (Use Radians): $(-1+i\sqrt{3})^{12}$

$(-1)^{12}[\cos 12(\frac{2\pi}{3}) + i \sin 12(\frac{2\pi}{3})] = 1$

29. Solve the following system of equations using matrices.

$$\begin{aligned} 2x + 3y - 4z &= -2 \\ x - y + 5z &= 11 \\ 4y + z &= -7 \end{aligned}$$

$x = -\frac{32}{55}$ $y = -\frac{122}{55}$ $z = \frac{103}{55}$

True or False:

30. The product of a 4×3 matrix multiplied by another 4×3 matrix is yet another 4×3 matrix. FALSE

31. The sum of a 4×3 matrix added to another 4×3 matrix is yet another 4×3 matrix. TRUE

32. Find the equation of the parabola: $y = ax^2 + bx + c$, that passes through the following three points: $(1,1)$, $(2,10)$, and $(3,23)$.

$y = 2x^2 + 3b - 4$

33. Let A= $\begin{pmatrix} 2 & -3 \\ 1 & -2 \\ 5 & 4 \end{pmatrix}$ and B= $\begin{pmatrix} 1 & 3 \\ 1 & -2 \\ 6 & 5 \end{pmatrix}$ and C= $\begin{pmatrix} -3 & 2 \\ 4 & -1 \end{pmatrix}$. Be certain that your answers are in proper format.

a) Solve: B+A $\begin{bmatrix} 3 & 0 \\ 2 & -4 \\ 11 & 9 \end{bmatrix}$

c) AxC $\begin{bmatrix} -18 & 8 \\ -11 & 4 \\ 1 & 6 \end{bmatrix}$

b) Solve: 3Ax2B No Solution

d) (BxC)+A $\begin{bmatrix} 11 & -4 \\ -10 & 2 \\ 7 & 11 \end{bmatrix}$

34. Write the first 5 terms of each sequence.

a. $a_1 = 5$, $a_{k+1} = 3(2 + a_k)$ $a_2 = 21$, $a_3 = 69$, $a_4 = 213$, $a_5 = 645$

b) $a_n = \dfrac{(n-1)!}{2n}$ $a_1 = \frac{1}{2}$, $a_2 = \frac{1}{4}$, $a_3 = \frac{1}{3}$, $a_4 = \frac{3}{4}$, $a_5 = \frac{12}{5}$

35. Use the Binomial Theorem to expand and simplify $(x^2 + 3)^5$.

$x^{10} + 15x^8 + 90x^6 + 270x^4 + 405x^2 + 243$

36. Seaholm decides to run its own lottery to help students pay for their college education. A player must match all five numbers from a choice of 1 through 30. Mrs. Lancaster asks you to figure out how many different combinations of five numbers are possible.

$_{30}C_5 = 142506$

37. Find the 15th term of the sequence where $a_{18} = 48$ and $r = \dfrac{1}{2}$. $a_{15} = 396$

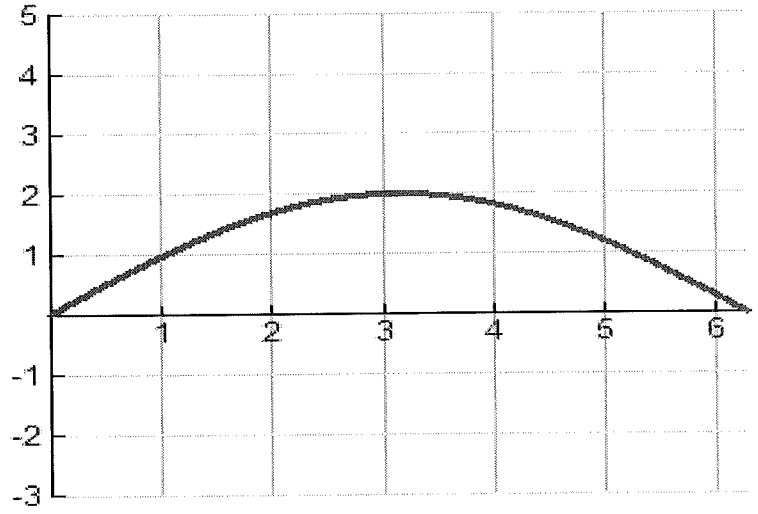
38. Find S_{12} for the series -7 + 35 - 175 + …. -762

39. Evaluate the infinite geometric series $3 + 2 + \dfrac{4}{3} + \dfrac{8}{9} + \ldots$. 9

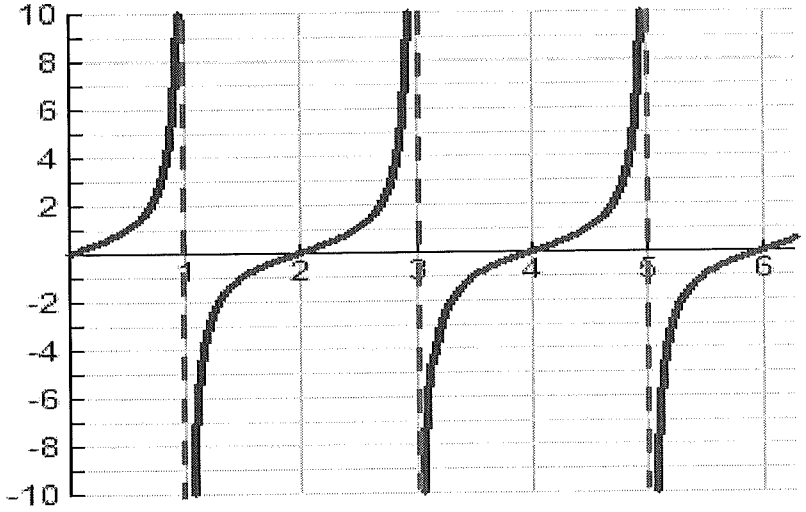
40. Find the sum: $\sum_{n=1}^{50} 3n$. 3825

Graph from **0 to** 2π **.**

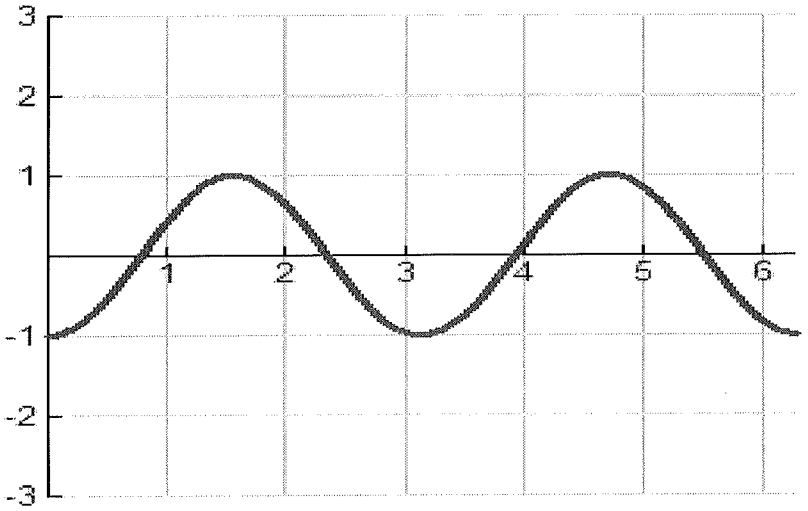
14. $y = 2\sin(\frac{1}{2}\theta)$



15. $y = \tan\left(\frac{\pi}{2}\theta\right)$



16. $y = -\cos 2\theta$



(17) $\csc x(\csc x - \sin x) + \frac{\sin x - \cos x}{\sin x} + \cot x = \csc^2 x$

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

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

$\csc^2 x$

(18) $\frac{1+\sin x}{1-\sin x} = 2\sec^2 x + 2\sec x \tan x - 1$

$\frac{1+\sin x}{1+\sin x} \cdot \frac{1+\sin x}{1-\sin x}$

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

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

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

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

(19) $\frac{\sec^2 x}{\cot x} - \tan^3 x = \tan x$

$\frac{1}{\cos^2 x} \cdot \frac{\sin x}{\cos x} - \frac{\sin^3 x}{\cos^3 x}$

$\frac{\sin x - \sin^3 x}{\cos^3 x}$

$\frac{\sin x (1 - \sin^2 x)}{\cos^3 x}$

$\frac{\sin x \cos^2 x}{\cos^3 x}$

$\tan x$

(20) $\frac{\sec x - \cos x}{\tan x} = \sin x$

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

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

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

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

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