Class Name : **MATH 1112 Spring 2020 - MWF - 11:15am - Ritter - Sec 52**

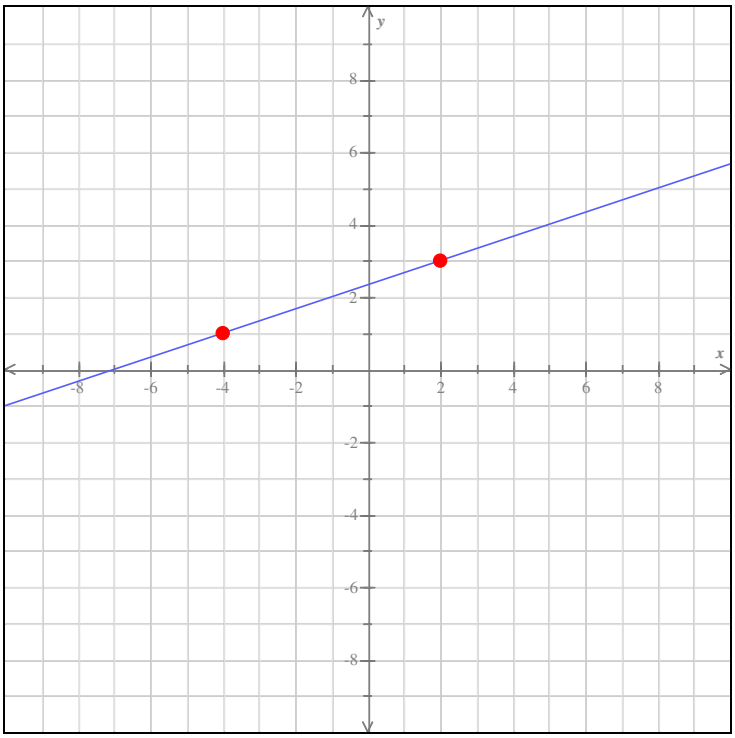
Instructor Name : **Ritter**

Student Name : _____

Instructor Note :

**Question 1 of 35**

Find an equation for the line below.




**Question 2 of 35**

Use the information given below to find $\tan(\alpha+\beta)$.

$\cos\alpha=\frac{4}{5}$, with $\alpha$ in quadrant IV

$\sin\beta=-\frac{4}{5}$, with $\beta$ in quadrant III

Give the exact answer, not a decimal approximation.

**Question 3 of 35**

Prove the identity.

$$\frac{\cos\left(\frac{3\pi}{2}-x\right)}{\cos(\pi+x)}=\tan x$$

**Question 4 of 35**

Prove the identity.

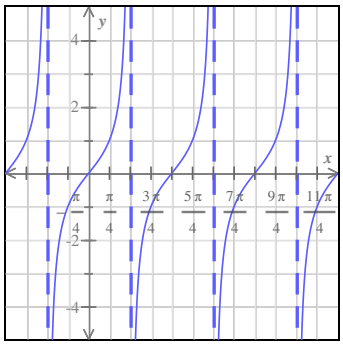
$$\sin(x+y) - \sin(x-y) = 2\cos x \sin y$$

**Question 5 of 35**

Three graphs are given below.
For each, choose its equation from the following.

$y = \csc x$ $\quad$ $y = 2\csc x$ $\quad$ $y = \sec\left(x + \frac{\pi}{4}\right)$

$y = \cot\left(x + \frac{\pi}{4}\right)$ $\quad$ $y = \tan\frac{x}{2}$ $\quad$ $y = \tan x$




$y = \csc x$

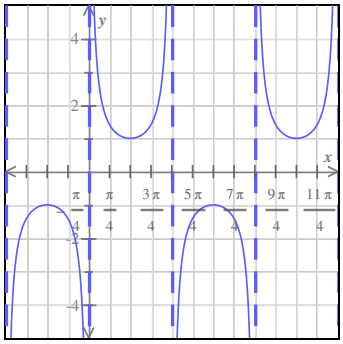
$y = \cot\left(x + \frac{\pi}{4}\right)$

$y = 2\csc x$

$y = \tan\frac{x}{2}$

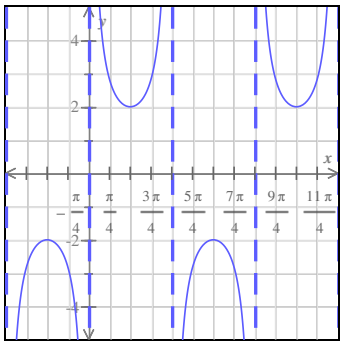
$y = \sec\left(x + \frac{\pi}{4}\right)$

$y = \tan x$




$y = \csc x$

$y = \cot\left(x + \frac{\pi}{4}\right)$

| |
|---|
| $y = 2\csc x$ |
| $y = \tan\dfrac{x}{2}$ |
| $y = \sec\left(x + \dfrac{\pi}{4}\right)$ |
| $y = \tan x$ |
|  |
| $y = \csc x$ |
| $y = \cot\left(x + \dfrac{\pi}{4}\right)$ |
| $y = 2\csc x$ |
| $y = \tan\dfrac{x}{2}$ |
| $y = \sec\left(x + \dfrac{\pi}{4}\right)$ |
| $y = \tan x$ |

**Question 6 of 35**

Find the exact value of $\tan^{-1}(-1)$.

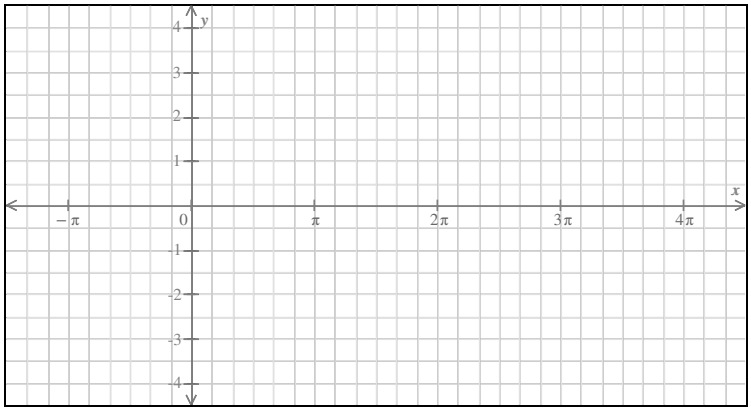
Write your answer in radians in terms of $\pi$.

**Question 7 of 35**

Rewrite $\sin\left(\tan^{-1}u\right)$ as an algebraic expression in $u$.

**Question 8 of 35**

Graph the function $y = 3\sin\left(\frac{3}{4}x\right) + 1$.




**Question 9 of 35**

Find the exact value of $\tan^{-1}\left(-\sqrt{3}\right)$.

Write your answer in radians in terms of π.

**Question 10 of 35**

Find the exact value of $\sin 15°$ by using a sum or difference formula.

**Question 11 of 35**

Write the trigonometric expression as an algebraic expression in $u$ and $v$.
Assume that the variables $u$ and $v$ represent positive real numbers.

$$\sin\left(\tan^{-1}u - \cos^{-1}v\right)$$

**Question 12 of 35**

What are the domains and ranges of the following functions?

| Function | | |
|---|---|---|
| $y = \sin x$ | Domain | ○ The set of all real numbers, except integer multiples of $\pi$.<br>○ The set of all real numbers, except odd integer multiples of $\frac{\pi}{2}$.<br>○ The set of all real numbers from $-1$ to $1$.<br>○ The set of all real numbers.<br>○ The set of all real numbers less than or equal to $-1$ or greater than or equal to $1$. |
| | Range | ○ The set of all real numbers, except integer multiples of $\pi$.<br>○ The set of all real numbers, except odd integer multiples of $\frac{\pi}{2}$.<br>○ The set of all real numbers from $-1$ to $1$.<br>○ The set of all real numbers.<br>○ The set of all real numbers less than or equal to $-1$ or greater than or equal to $1$. |
| $y = \csc x$ | Domain | ○ The set of all real numbers, except integer multiples of $\pi$.<br>○ The set of all real numbers, except odd integer multiples of $\frac{\pi}{2}$.<br>○ The set of all real numbers from $-1$ to $1$.<br>○ The set of all real numbers.<br>○ The set of all real numbers less than or equal to $-1$ or greater than or equal to $1$. |
| | Range | ○ The set of all real numbers, except integer multiples of $\pi$.<br>○ The set of all real numbers, except odd integer multiples of $\frac{\pi}{2}$.<br>○ The set of all real numbers from $-1$ to $1$.<br>○ The set of all real numbers.<br>○ The set of all real numbers less than or equal to $-1$ or greater than or equal to $1$. |
| $y = \tan x$ | Domain | ○ The set of all real numbers, except integer multiples of $\pi$.<br>○ The set of all real numbers, except odd integer multiples of $\frac{\pi}{2}$.<br>○ The set of all real numbers from $-1$ to $1$.<br>○ The set of all real numbers.<br>○ The set of all real numbers less than or equal to $-1$ or greater than or equal to $1$. |
| | Range | ○ The set of all real numbers, except integer multiples of $\pi$.<br>○ The set of all real numbers, except odd integer multiples of $\frac{\pi}{2}$.<br>○ The set of all real numbers from $-1$ to $1$.<br>○ The set of all real numbers.<br>○ The set of all real numbers less than or equal to $-1$ or greater than or equal to $1$. |

**Question 13 of 35**

Write the trigonometric expression as an algebraic expression in $u$ and $v$.

Assume that the variables $u$ and $v$ represent positive real numbers.

$$\sin\left(\sin^{-1}u - \tan^{-1}v\right)$$

**Question 14 of 35**

Find the exact value of $\sin^{-1}\left(-\frac{\sqrt{2}}{2}\right)$.

Write your answer in radians in terms of $\pi$.

**Question 15 of 35**

Prove the identity.

$$\sec^2 x\left(1-\sin^2 x\right)=1$$

**Question 16 of 35**

Find the amplitude, phase shift, and period of the function.

$$y=-1-2\sin\left(3x-\frac{\pi}{4}\right)$$

Give the exact values, not decimal approximations.

**Question 17 of 35**

Use the information given below to find $\cos(\alpha-\beta)$.

$\cos\alpha=\frac{4}{5}$, with $\alpha$ in quadrant I

$\sin\beta=-\frac{4}{5}$, with $\beta$ in quadrant III

Give the exact answer, not a decimal approximation.

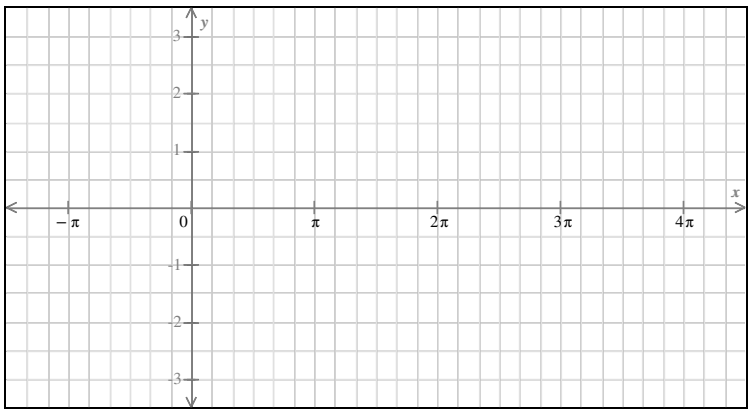
**Question 18 of 35**

Prove the identity.

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

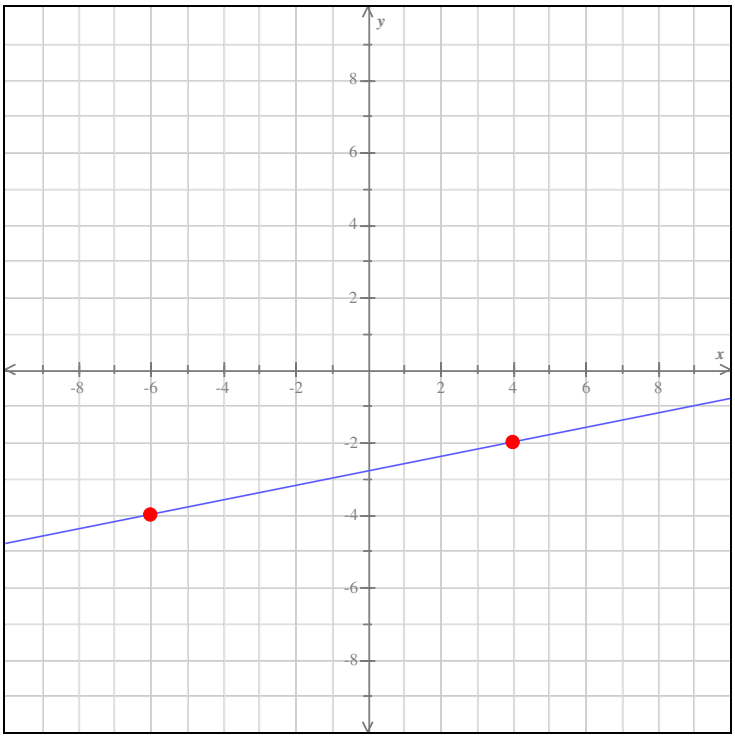
**Question 19 of 35**

Graph the function $y=3\sin\left(\frac{3}{4}x+\frac{\pi}{2}\right)$.



**Question 20 of 35**

Find an equation for the line below.




**Question 21 of 35**

Find the exact value of $\tan^{-1}(-1)$.

Write your answer in radians in terms of $\pi$.

**Question 22 of 35**

Prove the identity.

$$\cot x \cos x + \sin x = \csc x$$

**Question 23 of 35**

Find the exact value of $\sin^{-1}\left(\cos\frac{3\pi}{4}\right)$.

Write your answer in radians in terms of $\pi$.

**Question 24 of 35**

Find the exact value of $\csc\left(\tan^{-1}(-2)\right)$.

**Question 25 of 35**

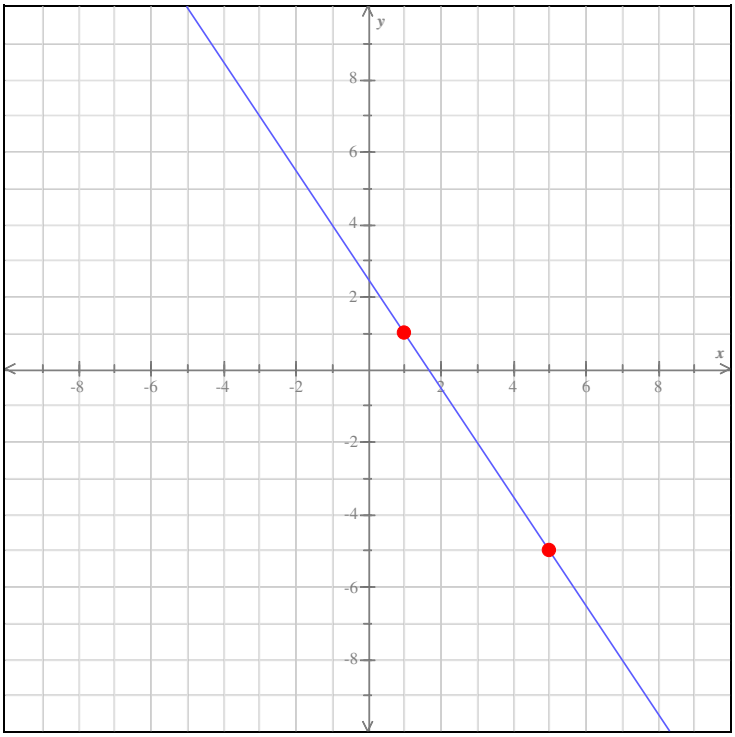
Simplify.

$$\frac{\tan x}{\sec x}$$

Use algebra and the fundamental trigonometric identities.
Your answer should be a number or use a single trigonometric function.

**Question 26 of 35**

Find an equation for the line below.




**Question 27 of 35**

Rewrite $\tan\left(\sin^{-1}\frac{w}{\sqrt{9+w^2}}\right)$ as an algebraic expression in $w$.

**Question 28 of 35**

Find the exact value of $\sin^{-1}\left(\sin\frac{7\pi}{6}\right)$.

Write your answer in radians in terms of $\pi$.

**Question 29 of 35**

Consider the line $y = -\frac{2}{3}x + 1$.

(a) Find the equation of the line that is parallel to this line and passes through the point $(3, \ -4)$.

(b) Find the equation of the line that is perpendicular to this line and passes through the point $(3, \ -4)$.

Note that a graphing calculator may be helpful in checking your answer.

**Question 30 of 35**

Simplify.

$$\frac{\sec x \cos x}{\tan x}$$

Use algebra and the fundamental trigonometric identities.
Your answer should be a number or use a single trigonometric function.

**Question 31 of 35**

Find the period and amplitude of the function.

$$y = -4 \sin 3x$$

Give the exact values, not decimal approximations.

Period:
Amplitude:

**Question 32 of 35**

Find the exact value of $\sin^{-1}\left(-\frac{\sqrt{2}}{2}\right)$.

Write your answer in radians in terms of $\pi$.

**Question 33 of 35**

Use a sum or difference formula to find the exact value of the following.

$$\sin\frac{\pi}{6}\cos\frac{\pi}{12} + \cos\frac{\pi}{6}\sin\frac{\pi}{12}$$

**Question 34 of 35**

Prove the identity.

$$\csc(-x) - \sin(-x) = -\cos x \cot x$$

**Question 35 of 35**

Find the exact value of $\tan\left(\sin^{-1}\left(\frac{5}{13}\right)\right)$.

# Quiz 3 #1 Answers for class MATH 1112 Spring 2020 - MWF - 11:15am - Ritter - Sec 52

**Question 1 of 35**

$$y=\frac{1}{3}x+\frac{7}{3}$$

**Question 2 of 35**

$$\tan(\alpha+\beta)=\frac{7}{24}$$

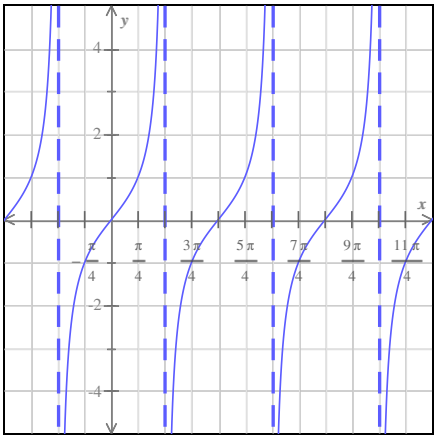
**Question 3 of 35**

| Statement | Rule |
|---|---|
| $\dfrac{\cos\left(\dfrac{3\pi}{2}-x\right)}{\cos(\pi+x)}$ | |
| $\dfrac{\cos\dfrac{3\pi}{2}\cos x+\sin\dfrac{3\pi}{2}\sin x}{\cos\pi\cos x-\sin\pi\sin x}$ | Sum and Difference |
| $\dfrac{0\cdot\cos x+(-1)\sin x}{(-1)\cos x-0\cdot\sin x}$ | Evaluation |
| $\dfrac{-\sin x}{-\cos x}$ | Algebra |
| $\dfrac{\sin x}{\cos x}$ | Algebra |
| $\tan x$ | Quotient |

**Question 4 of 35**

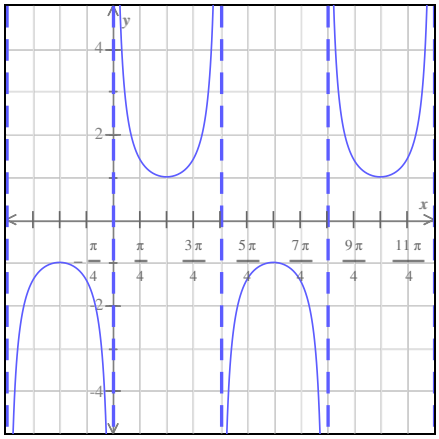
| Statement | Rule |
|---|---|
| $\sin(x+y)-\sin(x-y)$ | |
| $(\sin x\cos y+\cos x\sin y)-(\sin x\cos y-\cos x\sin y)$ | Sum and Difference |
| $\sin x\cos y+\cos x\sin y-\sin x\cos y+\cos x\sin y$ | Algebra |
| $2\cos x\sin y$ | Algebra |

**Question 5 of 35**



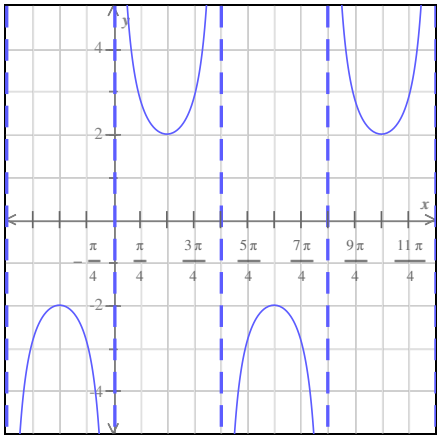
Equation:

$y = \tan x$



Equation:

$y = \csc x$



Equation:

$y = 2\csc x$

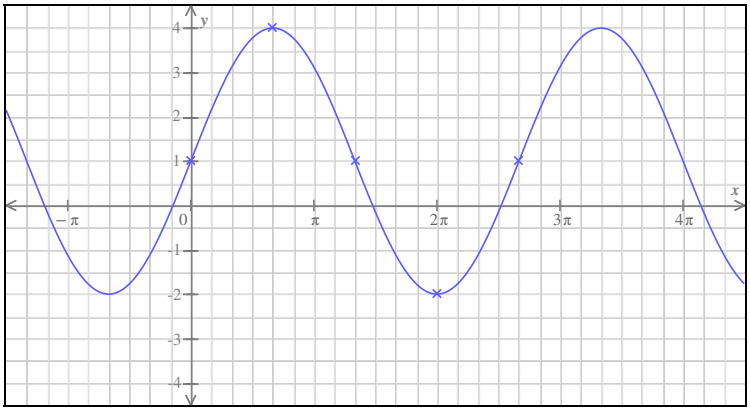
**Question 6 of 35**

$$\tan^{-1}(-1) = -\frac{\pi}{4}$$

**Question 7 of 35**

$$\sin\left(\tan^{-1}u\right) = \frac{u}{\sqrt{1+u^2}}$$

**Question 8 of 35**



**Question 9 of 35**

$$\tan^{-1}\left(-\sqrt{3}\right) = -\frac{\pi}{3}$$

**Question 10 of 35**

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

**Question 11 of 35**

$$\frac{uv-\sqrt{1-v^2}}{\sqrt{u^2+1}}$$

**Question 12 of 35**

| Function | | |
|---|---|---|
| $y=\sin x$ | Domain | The set of all real r |
| | Range | The set of all real r $-1$ $1$ |
| $y=\csc x$ | Domain | The set of all real r $\pi$ |
| | Range | The set of all real r $-1$ $1$ |
| $y=\tan x$ | Domain | The set of all real r $\frac{\pi}{2}$ |
| | Range | The set of all real r |

**Question 13 of 35**

$$\frac{u-v\sqrt{1-u^2}}{\sqrt{v^2+1}}$$

**Question 14 of 35**

$$\sin^{-1}\left(-\frac{\sqrt{2}}{2}\right)=-\frac{\pi}{4}$$

**Question 15 of 35**

| Statement | Rule |
|---|---|
| $\sec^2 x\left(1-\sin^2 x\right)$ | |
| $\frac{1}{\cos^2 x}\left(1-\sin^2 x\right)$ | Reciprocal |
| $\frac{1}{\cos^2 x}\cos^2 x$ | Pythagorean |
| $1$ | Algebra |

**Question 16 of 35**

Amplitude: $2$

Phase shift: $\frac{\pi}{12}$

Period: $\frac{2\pi}{3}$

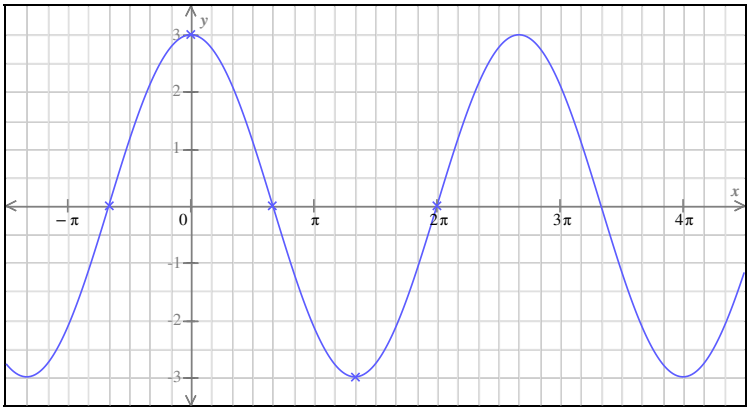
**Question 17 of 35**

$\cos(\alpha - \beta) = -\frac{24}{25}$

**Question 18 of 35**

| Statement | Rule |
|---|---|
| $\frac{\sin x}{1-\cos x}$ | |
| $\frac{\sin x}{1-\cos x} \cdot \frac{1+\cos x}{1+\cos x}$ | Algebra |
| $\frac{\sin x(1+\cos x)}{1-\cos^2 x}$ | Algebra |
| $\frac{\sin x(1+\cos x)}{\sin^2 x}$ | Pythagorean |
| $\frac{1+\cos x}{\sin x}$ | Algebra |
| $\frac{1}{\sin x} + \frac{\cos x}{\sin x}$ | Algebra |
| $\csc x + \frac{\cos x}{\sin x}$ | Reciprocal |
| $\csc x + \cot x$ | Quotient |

**Question 19 of 35**




**Question 20 of 35**

$y = \frac{1}{5}x - \frac{14}{5}$

**Question 21 of 35**

$$\tan^{-1}(-1) = -\frac{\pi}{4}$$

**Question 22 of 35**

| Statement | Rule |
|---|---|
| $\cot x \cos x + \sin x$ | |
| $\frac{\cos x}{\sin x} \cos x + \sin x$ | Quotient |
| $\frac{\cos^2 x}{\sin x} + \sin x$ | Algebra |
| $\frac{\cos^2 x + \sin^2 x}{\sin x}$ | Algebra |
| $\frac{1}{\sin x}$ | Pythagorean |
| $\csc x$ | Reciprocal |

**Question 23 of 35**

$$-\frac{\pi}{4}$$

**Question 24 of 35**

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

**Question 25 of 35**

$$\sin x$$

**Question 26 of 35**

$$y = -\frac{3}{2}x + \frac{5}{2}$$

**Question 27 of 35**

$$\tan\left(\sin^{-1}\frac{w}{\sqrt{9+w^2}}\right) = \frac{w}{3}$$

**Question 28 of 35**

$$-\frac{\pi}{6}$$

**Question 29 of 35**

Equation of parallel line: $y = -\frac{2}{3}x - 2$

Equation of perpendicular line: $y = \frac{3}{2}x - \frac{17}{2}$

**Question 30 of 35**

$\cot x$

**Question 31 of 35**

Period: $\frac{2\pi}{3}$

Amplitude: $4$

**Question 32 of 35**

$\sin^{-1}\left(-\frac{\sqrt{2}}{2}\right)=-\frac{\pi}{4}$

**Question 33 of 35**

$\frac{\sqrt{2}}{2}$

**Question 34 of 35**

| Statement | Rule |
|---|---|
| $\csc(-x)-\sin(-x)$ | |
| $-\csc x+\sin x$ | Odd//Even |
| $\frac{-1}{\sin x}+\sin x$ | Reciprocal |
| $\frac{-1+\sin^2 x}{\sin x}$ | Algebra |
| $\frac{-(1-\sin^2 x)}{\sin x}$ | Algebra |
| $\frac{-\cos^2 x}{\sin x}$ | Pythagorean |
| $-\cos x\cdot\frac{\cos x}{\sin x}$ | Algebra |
| $-\cos x\cot x$ | Quotient |

**Question 35 of 35**

$\frac{5}{12}$