Name:________________________________ Teacher:______________________ Period______

EVHS Math Analysis Semester 1 Final

Multiple Choice

Show all work neatly organized that leads to the solution in order to receive **FULL** credit. Be sure to check and circle your answers. **(5 points each)**

1 Which of the following would NOT pass the Vertical Line Test showing that y is a function of x?

A $9 = 8y^3 - 7x$

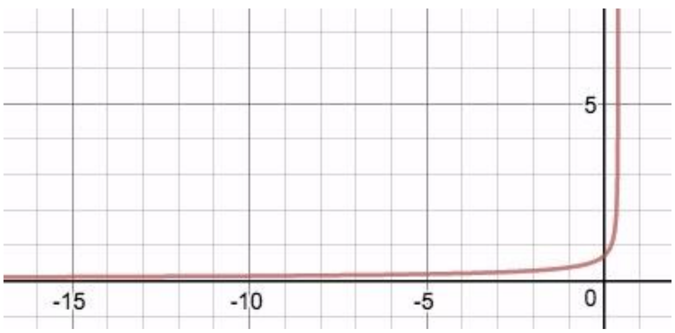
B $(x-2)^2 + 3y = 9$

C $x = y^2 - 2$

D $y = 5|x - 17| + 91$

2 State the domain and range of:

$f(x) = \frac{1}{\sqrt{2-5x}}$



A D: $\left(-\infty, \frac{5}{2}\right)$ $R: (0, \infty)$

B D: $\left(\frac{2}{5}, \infty\right)$ $R: (0, \infty)$

C D: $(-\infty, 0)$ $R: \left(\frac{2}{5}, \infty\right)$

D D: $\left(-\infty, \frac{2}{5}\right)$ $R: (0, \infty)$

3 How does $g(x)$ compare to the parent function $f(x)$?

$$f(x) = x^3$$

$$g(x) = (x+5)^3 + 17$$

A $g(x)$ is shifted 5 to the left and 17 up

B $g(x)$ is shifted 5 to the right and 17 down

C $g(x)$ is shifted 5 to the left and 17 down

D $g(x)$ is shifted 5 up and 17 to the left

4 What is $f(g(x))$ and $g(f(x))$ when $f(x) = 4 - 2x^2$, $g(x) = 2 - x$?

A $f(g(x)) = 4 - 8x + 2x^2$
$g(f(x)) = 2 - 2x^2$

B $f(g(x)) = -4 + 8x - 2x^2$
$g(f(x)) = -2 + 2x^2$

C $f(g(x)) = -4 - 2x^2$
$g(f(x)) = 2 + 2x^2$

D $f(g(x)) = -4 + 2x^2$
$g(f(x)) = 2 - 2x^2$

5 Find $\frac{f}{g}$ and state the domain.
$f(x) = x + 2$, $g(x) = x^2 - 3x + 2$

A $\frac{x^2-3x+2}{x+2}$, for $x \neq -2$

B $\frac{x+2}{3}$, for all real numbers

C $\frac{x+2}{x^2-3x+2}$, for $x \neq 1, 2$

D $x + 2$, for all real numbers

6 Which function listed below is "*one-to-one*"?

A $y = 5 - |x|$

B $y = \frac{1}{7}x^3 + x^2$

C $y = 3x^4 + 1$

D *None of the above*

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7 **Find the end behavior for $f(x)$ using the Leading Coefficient Test.**

$$f(x) = -2x^5 + 3x^3 + 5x$$

A $f(x) \to -\infty,\ x \to -\infty;\ f(x) \to -\infty,\ x \to \infty$

B $f(x) \to -\infty,\ x \to -\infty;\ f(x) \to \infty,\ x \to \infty$

C $f(x) \to \infty,\ x \to -\infty;\ f(x) \to -\infty,\ x \to \infty$

D $f(x) \to \infty,\ x \to -\infty;\ f(x) \to \infty,\ x \to \infty$

8 **Divide $f(x)$ by $d(x)$.**

$$f(x) = 5x^4 - 17x^3 + 19x^2 - 91 \qquad d(x) = x - 3$$

A $\frac{f(x)}{d(x)} = 5x^3 - 2x^2 + 13x + 39 - \frac{x-3}{26}$

B $\frac{f(x)}{d(x)} = 5x^4 - 2x^3 + 13x^2 + 39x - \frac{26}{x-3}$

C $\frac{f(x)}{d(x)} = 5x^3 - 2x^2 + 13x + 39 - \frac{26}{x-3}$

D $\frac{f(x)}{d(x)} = 5x^3 - 2x^2 + 13x + 39 + \frac{26}{x-3}$

9 **Find a polynomial function that has the given zeros.**

zeros: $-4, -3,\ 4$

A $f(x) = x^3 + 3x^2 - 16x + 48$

B $f(x) = x^3 + 3x^2 - 16x - 48$

C $f(x) = x^3 - 3x^2 - 16x + 48$

D $f(x) = x^3 - 3x^2 - 16x - 48$

10 **Perform the operation and write the result in standard form $(a + bi)$.**

$$(4 + i) \cdot (-5 + 3i)$$

A $23 - 7i$

B $-23 + 7i$

C $23 + 7i$

D $-23 - 7i$

11 **Find ALL of the zeros of the function using the given function and one of its zeros. (2 points)**

$$f(x) = 3x^3 - 4x^2 + 3x - 4 \qquad Zero\colon -i$$

A $\pm i, -\frac{4}{3}$

B $\pm i, -\frac{3}{4}$

C $\pm i, \frac{3}{4}$

D $\pm i, \frac{4}{3}$

12 **Simplify the complex number and write it in standard form.**

$$9i^4 + 2i^3 + 5i^2$$

A $-9 + 7i$

B $-4 + 2i$

C $-7 + 9i$

D $4 - 2i$

Name:______________________ Teacher:______________________ Period________

13 **Find a polynomial function f with real coefficients that has the given zeros.**

$$\boldsymbol{zeros: 6, -2i}$$

A $x^3 - 6x^2 + 4x - 24$

B $4x - 24$

C $4x + 24$

D $x^3 - 6x^2 - 4x + 24$

14 **Given $f(x) = a_n x^n + a_{n-1}x^{n-1} + \cdots + a_2 x^2 + a_1 x^1 + a_0 x^0$ is a polynomial with real coefficients and $a_0 \neq 0$. Which of the following statements is always true?**

A $f(x)$ has **exactly** n real zeros.

B The graph of $f(x)$ has **at most** n turning points.

C $f(x)$ has **exactly** n linear factors.

D The graph of $f(x)$ has exactly $(n-1)$ turning points.

15 **Find any HOLES and ASYMPTOTES in the graph of the given rational function.**

$$f(x) = \frac{2x^2 - 4x - 2}{x - 2}$$

A $Hole: x = 2, VA: x = 2,\ HA: y = 0$

B $Hole: none, VA: x = 2,\ SA: y = 2x$

C $Hole: x = 2, VA: x = 2,\ HA: y = 1$

D $Hole: none, VA: x = 2,\ SA: y = x$

16 **Find any HOLES and ASYMPTOTES in the graph of the given rational function.**

$$f(x) = \frac{x + 2}{x^2 - 3x + 2}$$

A $Hole: x = -2, VA: x = 1, HA: y = 0$

B $Hole: x = -2, VA: x = 1, SA: y = x - 5$

C $Hole: none, VA: x = 1,2, HA: y = 0$

D $Hole: none, VA: x = 1,2, SA: y = x - 5$

17 **State the domain of the function:**

$$f(x) = \frac{2}{x^2 - 1}$$

A $(-\infty, -1) \cup (1, \infty)$

B $(-\infty, -1) \cup (-1, 1) \cup (1, \infty)$

C $(-\infty, -1] \cup (-1, 1) \cup [1, \infty)$

D $(-\infty, 2) \cup (2, \infty)$

18 **Solve for x in the equation $16^x = 8^{2x-1}$**

A $x = \frac{2}{3}$

B $x = \frac{3}{2}$

C $-\frac{3}{2}$

D $\frac{1}{3}$

Name:______________________________ Teacher:______________________ Period______

19 **Find the range of $g(x) = 3 - e^x$**

A $(3, \infty)$

B $(0, \infty)$

C $(-\infty, \infty)$

D $(-\infty, 3)$

20 **Find the domain of the function:**

$\boldsymbol{f(x) = 3\log(5x - 2)}$ **.**

A $(-\infty, \infty)$

B $\left(-\frac{1}{3}, \infty\right)$

C $\left(\frac{2}{5}, \infty\right)$

D $\left(\frac{8}{125}, \infty\right)$

21 **Rewrite the logarithmic function in its exponential form.**

$$\log_4 32 = \frac{5}{2}$$

A $\left(\frac{5}{2}\right)^4 = 27$

B $4^{32} = \frac{5}{2}$

C $32^{5/2} = 4$

D $4^{5/2} = 32$

22 **CONDENSE the expression using the properties of logarithms.**

$$f(x) = \frac{1}{4}\log_b 16 - 2\log_b 5 + \log_b 7$$

A $\log_b \frac{2}{175}$

B $\log_b \frac{14}{25}$

C $\log_b \frac{28}{25}$

D $\log_b \frac{14}{5}$

23 **Evaluate the logarithm WITHOUT a calculator.**

$$3\log_{25} 5 =$$

A $\frac{3}{2}$

B $\frac{3}{5}$

C 15

D 6

24 **EXPAND the expression using the properties of logarithms.**

$$f(x) = \ln\sqrt{\frac{a^2b^3}{c}}$$

A $\frac{1}{2}(2\ln a + 3\ln b - \ln c)$

B $\frac{1}{2}\left(\frac{2\ln a + 3\ln b}{\ln c}\right)$

C $\sqrt{2\ln a + 3\ln b - \ln c}$

D $\sqrt{\frac{2\ln a + 3\ln b}{\ln c}}$

Name:______________________________ Teacher:______________________ Period______

$\boxed{25}$ **What is the inverse of $f(x) = -2x^5 + 10$?**

A $\sqrt[5]{\frac{1}{2}x - 5}$

B $\sqrt[5]{20 - x}$

C $\frac{\sqrt[5]{20-x}}{2}$

D $\sqrt[5]{5 - \frac{1}{2}x}$

$\boxed{26}$ **Solve for x.**

$$\log_2(x^2 - 49) - \log_2(x - 7) = 4$$

A 7

B 8

C 9

D 6

$\boxed{27}$ **Simplify $2e^{3\ln(x+1)}$.**

A $2(x+1)e^3$

B $2(x+1)^3$

C $6(x+1)$

D $3(x+1)\ln 2$

$\boxed{28}$ **Find one Positive and one Negative coterminal angle of $\theta = -\frac{7\pi}{12}$.**

A $\frac{17\pi}{12}, -\frac{31\pi}{12}$

B $\frac{5\pi}{12}, -\frac{19\pi}{12}$

C $-\frac{17\pi}{12}, \frac{31\pi}{12}$

D $-\frac{5\pi}{12}, -\frac{9\pi}{12}$

$\boxed{29}$ To find the height of the tree you can use the length of its shadow and the angle of elevation. **Find the height of the tree whose shadow is 18 feet long at an angle of elevation that is 30°.** *If you were to cut this tree down for the holidays and could <u>only bring home a tree **no taller than 7 feet** how high do you need to cut it</u>?*

A $6\,feet,\ cut\ at\ the\ base\ of\ the\ tree$

B $5\sqrt{3}\,feet,\ \ cut\ at\ about\ 3.4\,ft$

C $6\sqrt{3}\,feet,\ \ cut\ at\ about\ 3.4\,ft$

D $9\,feet,\ \ cut\ at\ about\ 2\,ft\ off\ the\ ground$

$\boxed{30}$ **Find the reference angle θ' for the given angle θ.**

$$\theta = \frac{17\pi}{15}$$

A $\theta' = \frac{32\pi}{15}$

B $\theta' = \frac{13\pi}{15}$

C $\theta' = \frac{2\pi}{15}$

D $\theta' = \frac{11\pi}{15}$

$\boxed{31}$ **$\csc\theta = -\frac{6}{5}$, θ is in Quadrant III**

$\tan\theta =$

A $-\frac{\sqrt{11}}{5}$

B $\frac{5\sqrt{11}}{11}$

C $\frac{\sqrt{61}}{6}$

D $-\frac{11\sqrt{61}}{61}$

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$\boxed{32}$ **Identify the period and amplitude of the given trigonometric function.**

$$f(x) = 3\sin 4x + 5$$

A $\quad Period: \frac{2\pi}{3} \quad Amplitude: 4$

B $\quad Period: \frac{\pi}{2} \quad Amplitude: 4$

C $\quad Period: \frac{\pi}{2} \quad Amplitude: 3$

D $\quad Period: \frac{2\pi}{3} \quad Amplitude: 3$

$\boxed{33}$ **Evaluate the function:**

$$\sec^2\frac{5\pi}{3} - \tan^2\frac{5\pi}{3} =$$

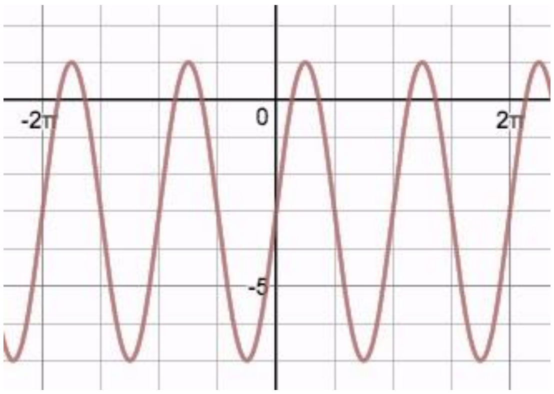
A $\quad -1$

B $\quad \frac{-\sqrt{3}+1}{2}$

C $\quad 1$

D $\quad \frac{-1-\sqrt{3}}{2}$

$\boxed{34}$ **Find the equation of the graph below.**



A $\quad y = 4\cos(2x) - 3$

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

C $\quad y = 4\sin(2x) - 3$

D $\quad y = 2\sin(4x) - 3$

$\boxed{35}$ $\mathbf{\tan(-210°)} =$

A $\quad -\frac{\sqrt{3}}{3}$

B $\quad \sqrt{3}$

C $\quad \frac{\sqrt{3}}{3}$

D $\quad -\sqrt{3}$

$\boxed{36}$ **Use the fundamental identities to simplify the expression.**

$$\sec x\,(1 - \cos^2 x)$$

A $\quad 1$

B $\quad \tan^2 x$

C $\quad \cos x$

D $\quad \sin x \tan x$

$\boxed{37}$ **Use the fundamental identities to simplify the expression.**

$$\frac{\sec^2\theta - \tan^2\theta}{\csc^2\theta}$$

A $\quad \cos^2\theta$

B $\quad \sin^2\theta$

C $\quad \csc^2\theta$

D $\quad \sec^2\theta$

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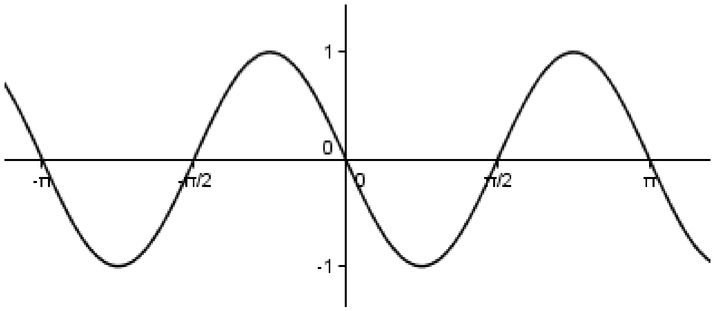
$\boxed{38}$ **Find *a, b, c,* and *d* so that the graph of $y = a\ \cos(bx - c)$ matches the graph below.**



A $\qquad a = 1, b = 2, c = -\frac{\pi}{2}$

B $\qquad a = 1, b = \frac{1}{2}, c = -\pi$

C $\qquad a = -1, b = 2, c = -\pi$

D $\qquad a = -1, b = \frac{1}{2}, c = -\frac{\pi}{2}$

$\boxed{39}$ **Find all solutions in the interval $[\mathbf{0}, \mathbf{2\pi})$ algebraically.**

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

A $\qquad x = 0, \frac{\pi}{2}, \pi$

B $\qquad x = \frac{\pi}{2}, \pi, \frac{3\pi}{2}$

C $\qquad x = \frac{\pi}{4}, \frac{\pi}{2}, \frac{3\pi}{2}$

D $\qquad x = 0, \pi, \frac{3\pi}{2}$

$\boxed{40}$ What is the **missing step** in the verification of the identity?

$$\mathbf{2 - \sec^2 x = 1 - \tan^2 x}$$
$$\boxed{\qquad\qquad\qquad} \mathbf{=}$$
$$\mathbf{2 - 1 - \tan^2 x =}$$
$$\mathbf{1 - \tan^2 x = 1 - \tan^2 x}$$

A $\qquad 2 - 1 - \csc^2 x$

B $\qquad 2 - 1 + \tan^2 x$

C $\qquad 2 - (1 + \tan^2 x)$

D $\qquad 2 - (1 - \csc^2 x)$

Guess your Score: _________/200
(If guessed correctly +1 extra credit point)

- Circle any problem # that you are unsure about but think you did correctly.
- Box any problem that you have NO IDEA how to do but tried anyways.

On a scale of 1–10 how prepared did you feel? WHY?

1———————————————————10

Ooops! $\qquad\qquad$ Great!

The final is today? $\qquad\qquad$ I've got this!!

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EVHS Math Analysis Semester 1 Final

Multiple Choice

Show all work neatly organized that leads to the solution in order to receive **FULL** credit. Be sure to check and circle your answers. **(5 points each)**

1 **Which function listed below is "*one-to-one*"?**

A $y = 5 - |x|$

B $y = \frac{1}{7}x^3 + x^2$

C $y = 3x^4 + 1$

D *None of the above*

2 **What is $f(g(x))$ and $g(f(x))$ when $f(x) = 4 - 2x^2$, $g(x) = 2 - x$?**

A $f(g(x)) = 4 - 8x + 2x^2$
$g(f(x)) = 2 - 2x^2$

B $f(g(x)) = -4 + 8x - 2x^2$
$g(f(x)) = -2 + 2x^2$

C $f(g(x)) = -4 - 2x^2$
$g(f(x)) = 2 + 2x^2$

D $f(g(x)) = -4 + 2x^2$
$g(f(x)) = 2 - 2x^2$

3 **Find $\frac{f}{g}$ and state the domain.**
$f(x) = x + 2$, $g(x) = x^2 - 3x + 2$

A $\frac{x^2-3x+2}{x+2}$, for $x \neq -2$

B $\frac{x+2}{3}$, for all real numbers

C $\frac{x+2}{x^2-3x+2}$, for $x \neq 1, 2$

D $x + 2$, for all real numbers

4 **Which of the following would NOT pass the Vertical Line Test showing that y is a function of *x*?**

A $9 = 8y^3 - 7x$

B $(x-2)^2 + 3y = 9$

C $x = y^2 - 2$

D $y = 5|x - 17| + 91$

5 **How does $g(x)$ compare to the parent function $f(x)$?**

$$f(x) = x^3$$
$$g(x) = (x+5)^3 + 17$$

A $g(x)$ is shifted 5 to the left and 17 up

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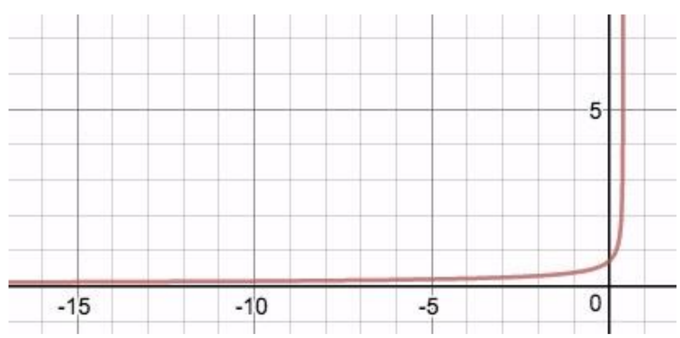
D $g(x)$ is shifted 5 up and 17 to the left

6 **State the domain and range of:**

$$f(x) = \frac{1}{\sqrt{2-5x}}$$



A D: $\left(-\infty, \frac{5}{2}\right)$ $R: (0, \infty)$

B D: $\left(\frac{2}{5}, \infty\right)$ $R: (0, \infty)$

C D: $(-\infty, 0)$ $R: \left(\frac{2}{5}, \infty\right)$

D D: $\left(-\infty, \frac{2}{5}\right)$ $R: (0, \infty)$

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$\boxed{7}$ **Divide $f(x)$ by $d(x)$.**

$$f(x) = 5x^4 - 17x^3 + 19x^2 - 91 \qquad d(x) = x - 3$$

A $\frac{f(x)}{d(x)} = 5x^3 - 2x^2 + 13x + 39 - \frac{x-3}{26}$

B $\frac{f(x)}{d(x)} = 5x^4 - 2x^3 + 13x^2 + 39x - \frac{26}{x-3}$

C $\frac{f(x)}{d(x)} = 5x^3 - 2x^2 + 13x + 39 - \frac{26}{x-3}$

D $\frac{f(x)}{d(x)} = 5x^3 - 2x^2 + 13x + 39 + \frac{26}{x-3}$

$\boxed{8}$ **Find a polynomial function that has the given zeros.**

zeros: $-4, -3, 4$

A $f(x) = x^3 + 3x^2 - 16x + 48$

B $f(x) = x^3 + 3x^2 - 16x - 48$

C $f(x) = x^3 - 3x^2 - 16x + 48$

D $f(x) = x^3 - 3x^2 - 16x - 48$

$\boxed{9}$ **Find the end behavior for $f(x)$ using the Leading Coefficient Test.**

$$f(x) = -2x^5 + 3x^3 + 5x$$

A $f(x) \to -\infty,\ x \to -\infty;\ f(x) \to -\infty,\ x \to \infty$

B $f(x) \to -\infty,\ x \to -\infty;\ f(x) \to \infty,\ x \to \infty$

C $f(x) \to \infty,\ x \to -\infty;\ f(x) \to -\infty,\ x \to \infty$

D $f(x) \to \infty,\ x \to -\infty;\ f(x) \to \infty,\ x \to \infty$

$\boxed{10}$ **Simplify the complex number and write it in standard form.**

$$9i^4 + 2i^3 + 5i^2$$

A $-9 + 7i$

B $-4 + 2i$

C $-7 + 9i$

D $4 - 2i$

$\boxed{11}$ **Perform the operation and write the result in standard form $(a + bi)$.**

$$(4 + i) \cdot (-5 + 3i)$$

A $23 - 7i$

B $-23 + 7i$

C $23 + 7i$

D $-23 - 7i$

$\boxed{12}$ **Find ALL of the zeros of the function using the given function and one of its zeros.** (2 points)

$$f(x) = 3x^3 - 4x^2 + 3x - 4 \qquad Zero: -i$$

A $\pm i, -\frac{4}{3}$

B $\pm i, -\frac{3}{4}$

C $\pm i, \frac{3}{4}$

D $\pm i, \frac{4}{3}$

Name:________________________ Teacher:____________________ Period______

$\boxed{13}$ **Given $f(x) = a_n x^n + a_{n-1}x^{n-1} + \cdots + a_2 x^2 + a_1 x^1 + a_0 x^0$ is a polynomial with real coefficients and $a_0 \neq 0$. Which of the following statements is <u>always true</u>?**

A $f(x)$ has **exactly** n real zeros.

B The graph of $f(x)$ has **at most** n turning points.

C $f(x)$ has **exactly** n linear factors.

D The graph of $f(x)$ has exactly $(n-1)$ turning points.

$\boxed{14}$ **Find a polynomial function f with real coefficients that has the given zeros.**

$$zeros: 6, -2i$$

A $x^3 - 6x^2 + 4x - 24$

B $4x - 24$

C $4x + 24$

D $x^3 - 6x^2 - 4x + 24$

$\boxed{15}$ **State the domain of the function:**

$$f(x) = \frac{2}{x^2 - 1}$$

A $(-\infty, -1) \cup (1, \infty)$

B $(-\infty, -1) \cup (-1, 1) \cup (1, \infty)$

C $(-\infty, -1] \cup (-1, 1) \cup [1, \infty)$

D $(-\infty, 2) \cup (2, \infty)$

$\boxed{16}$ **Find any HOLES and ASYMPTOTES in the graph of the given rational function.**

$$f(x) = \frac{x + 2}{x^2 - 3x + 2}$$

A $Hole: x = -2, VA: x = 1, HA: y = 0$

B $Hole: x = -2, VA: x = 1, SA: y = x - 5$

C $Hole: none, VA: x = 1,2, HA: y = 0$

D $Hole: none, VA: x = 1,2, SA: y = x - 5$

$\boxed{17}$ **Find any HOLES and ASYMPTOTES in the graph of the given rational function.**

$$f(x) = \frac{2x^2 - 4x - 2}{x - 2}$$

A $Hole: x = 2, VA: x = 2,\ HA: y = 0$

B $Hole: none, VA: x = 2,\ SA: y = 2x$

C $Hole: x = 2, VA: x = 2,\ HA: y = 1$

D $Hole: none, VA: x = 2,\ SA: y = x$

$\boxed{18}$ **Solve for x in the equation $16^x = 8^{2x-1}$**

A $x = \frac{2}{3}$

B $x = \frac{3}{2}$

C $-\frac{3}{2}$

D $\frac{1}{3}$

Name:________________________________ Teacher:________________________ Period________

$\boxed{19}$ **Find the range of $g(x) = 3 - e^x$**

A $(3, \infty)$

B $(0, \infty)$

C $(-\infty, \infty)$

D $(-\infty, 3)$

$\boxed{20}$ **CONDENSE the expression using the properties of logarithms.**

$$f(x) = \frac{1}{4}\log_b 16 - 2\log_b 5 + \log_b 7$$

A $\log_b \frac{2}{175}$

B $\log_b \frac{14}{25}$

C $\log_b \frac{28}{25}$

D $\log_b \frac{14}{5}$

$\boxed{21}$ **Evaluate the logarithm WITHOUT a calculator.**

$$3\log_{25} 5 =$$

A $\frac{3}{2}$

B $\frac{3}{5}$

C 15

D 6

$\boxed{22}$ **Find the domain of the function:**

$$\boldsymbol{f(x) = 3\log(5x - 2)}.$$

A $(-\infty, \infty)$

B $\left(-\frac{1}{3}, \infty\right)$

C $\left(\frac{2}{5}, \infty\right)$

D $\left(\frac{8}{125}, \infty\right)$

$\boxed{23}$ **Rewrite the logarithmic function in its exponential form.**

$$\log_4 32 = \frac{5}{2}$$

A $\left(\frac{5}{2}\right)^4 = 27$

B $4^{32} = \frac{5}{2}$

C $32^{5/2} = 4$

D $4^{5/2} = 32$

$\boxed{24}$ **EXPAND the expression using the properties of logarithms.**

$$f(x) = \ln\sqrt{\frac{a^2b^3}{c}}$$

A $\frac{1}{2}(2\ln a + 3\ln b - \ln c)$

B $\frac{1}{2}\left(\frac{2\ln a + 3\ln b}{\ln c}\right)$

C $\sqrt{2\ln a + 3\ln b - \ln c}$

D $\sqrt{\frac{2\ln a + 3\ln b}{\ln c}}$

Name:______________________________ Teacher:________________________ Period________

$\boxed{25}$ **What is the inverse of $f(x) = -2x^5 + 10$?**

A $\sqrt[5]{\frac{1}{2}x - 5}$

B $\sqrt[5]{20 - x}$

C $\frac{\sqrt[5]{20-x}}{2}$

D $\sqrt[5]{5 - \frac{1}{2}x}$

$\boxed{26}$ **Simplify $2e^{3\ln(x+1)}$.**

A $2(x+1)e^3$

B $2(x+1)^3$

C $6(x+1)$

D $3(x+1)\ln 2$

$\boxed{27}$ **Solve for x.**

$$\log_2(x^2 - 49) - \log_2(x - 7) = 4$$

A 7

B 8

C 9

D 6

$\boxed{28}$ **Find one Positive and one Negative coterminal angle of $\theta = -\frac{7\pi}{12}$.**

A $\frac{17\pi}{12}, -\frac{31\pi}{12}$

B $\frac{5\pi}{12}, -\frac{19\pi}{12}$

C $-\frac{17\pi}{12}, \frac{31\pi}{12}$

D $-\frac{5\pi}{12}, -\frac{9\pi}{12}$

$\boxed{29}$ **Find the reference angle θ' for the given angle θ.**

$$\theta = \frac{17\pi}{15}$$

A $\theta' = \frac{11\pi}{15}$

B $\theta' = \frac{13\pi}{15}$

C $\theta' = \frac{2\pi}{15}$

D $\theta' = \frac{32\pi}{15}$

$\boxed{30}$ To find the height of the tree you can use the length of its shadow and the angle of elevation. **Find the height of the tree whose shadow is 18 feet long at an angle of elevation that is 30°.** *If you were to cut this tree down for the holidays and could only bring home a tree **no taller than 7 feet** how high do you need to cut it?*

A $6\,feet,\ cut\ at\ the\ base\ of\ the\ tree$

B $5\sqrt{3}\,feet,\ \ cut\ at\ about\ 3.4\ ft$

C $6\sqrt{3}\,feet,\ \ cut\ at\ about\ 3.4\ ft$

D $9\,feet,\ \ cut\ at\ about\ 2\ ft\ off\ the\ ground$

$\boxed{31}$ **$\csc\theta = -\frac{6}{5}$, θ is in Quadrant III**

$\tan\theta =$

A $-\frac{\sqrt{11}}{5}$

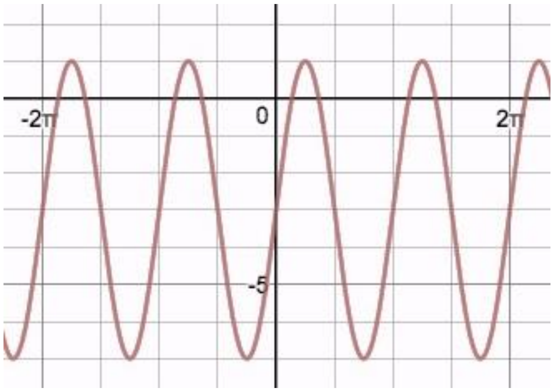
B $\frac{5\sqrt{11}}{11}$

C $\frac{\sqrt{61}}{6}$

D $-\frac{11\sqrt{61}}{61}$

Name:________________________ Teacher:____________________ Period______

$\boxed{32}$ **Find the equation of the graph below.**



A $y = 4\cos(2x) - 3$

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

C $y = 4\sin(2x) - 3$

D $y = 2\sin(4x) - 3$

$\boxed{33}$ **Identify the period and amplitude of the given trigonometric function.**

$$f(x) = 3\sin 4x + 5$$

A $Period: \frac{2\pi}{3}$ $Amplitude: 4$

B $Period: \frac{\pi}{2}$ $Amplitude: 4$

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

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

$\boxed{34}$ **Evaluate the function:**

$$\sec^2\frac{5\pi}{3} - \tan^2\frac{5\pi}{3} =$$

A 1

B $\frac{-\sqrt{3}+1}{2}$

C -1

D $\frac{-1-\sqrt{3}}{2}$

$\boxed{35}$ $\mathbf{\tan(-210°)} =$

A $-\frac{\sqrt{3}}{3}$

B $\sqrt{3}$

C $\frac{\sqrt{3}}{3}$

D $-\sqrt{3}$

$\boxed{36}$ **Use the fundamental identities to simplify the expression.**

$$\frac{\sec^2\theta - \tan^2\theta}{\csc^2\theta}$$

A $\cos^2\theta$

B $\sin^2\theta$

C $\csc^2\theta$

D $\sec^2\theta$

$\boxed{37}$ What is the **missing step** in the verification of the identity?

$$\mathbf{2 - \sec^2 x = 1 - \tan^2 x}$$
$$\boxed{} \mathbf{=}$$
$$\mathbf{2 - 1 - \tan^2 x =}$$
$$\mathbf{1 - \tan^2 x = 1 - \tan^2 x}$$

A $2 - 1 - \csc^2 x$

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

C $2 - (1 + \tan^2 x)$

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

Name:______________________________ Teacher:_______________________ Period______

$\boxed{38}$ **Use the fundamental identities to simplify the expression.**

$$\sec x\,(1-\cos^2 x)$$

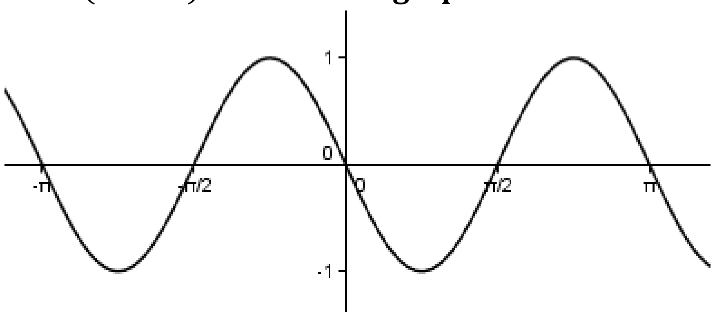
A 1

B $\tan^2 x$

C $\cos x$

D $\sin x \tan x$

$\boxed{39}$ **Find *a, b, c,* and *d* so that the graph of $y = a\,\cos(bx - c)$ matches the graph below.**



A $a = 1, b = 2, c = -\frac{\pi}{2}$

B $a = 1, b = \frac{1}{2}, c = -\pi$

C $a = -1, b = 2, c = -\pi$

D $a = -1, b = \frac{1}{2}, c = -\frac{\pi}{2}$

$\boxed{40}$ **Find all solutions in the interval $[0, 2\pi)$ algebraically.**

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

A $x = 0, \frac{\pi}{2}, \pi$

B $x = \frac{\pi}{2}, \pi, \frac{3\pi}{2}$

C $x = \frac{\pi}{4}, \frac{\pi}{2}, \frac{3\pi}{2}$

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

Guess your Score: _________/200
(If guessed correctly +1 extra credit point)

- Circle any problem # that you are unsure about but think you did correctly.
- Box any problem that you have NO IDEA how to do but tried anyways.

On a scale of 1–10 how prepared did you feel? WHY?

1————————————————10

Ooops! The final is today? | Great! I've got this!!