Honors Algebra 2B Math Review--5

Name: _____

Hour: _____

To be eligible for any amount of credit:

WRITE OUT THE ALL OF THE ORIGINAL PROBLEMS AND SHOW YOUR WORK ON A SEPARATE SHEET OF PAPER. Work and/or Answers on this sheet will not be accepted for any amount of credit.

Prove:

1. $-3\log_4\frac{1}{16}+2\log_3\frac{1}{27}+\log 10=\left(2\cos^2\theta-\cos 2\theta\right)\bullet\left(\frac{1}{\sin^2\theta}-\cot^2\theta\right)$

Verify the identity. Work only one side of the identity to be eligible for any amount of credit.

2. a) $\cos 3\theta=\cos^3\theta-3\sin^2\theta\cos\theta$ b) $\frac{\sin 4\phi+\sin 6\phi}{\cos 4\phi-\cos 6\phi}=\cot\phi$

c) $\cos 3\theta=\cos^3\theta-3\sin^2\theta\cos\theta$ d) $\frac{\cot\theta-\tan\theta}{\cot\theta+\tan\theta}=\cos 2\theta$

3. What is the value of "x" if: $13e^{2x}=65$?

4. Describe the vertical asymptotes and holes for the graph of the rational function.

$$f(x)=\frac{x^2-13x-30}{x^2-4}$$

5. Solve $\log(x+2)+\log(x)=\log(9x+18)-\log 3$

6. Find the exact value of $\sin\left(\arccos\frac{7}{25}\right)$.

7. Find all solutions to Solve on the interval $[0,2\pi)$

$$2\cos 2\theta+\sqrt{12}=\sqrt{27}$$

True or False? (#8-10)

8. $\sin^2\theta+\tan^2\theta+\csc^2\theta=\sec^2\theta-\cos^2\theta+\cot^2\theta$

9. $\sin\frac{\pi}{3}=\frac{1}{\csc\left(\frac{-64\pi}{48}\right)}$

10. $\frac{\csc\theta}{\sec\theta}=\sqrt{\frac{\cot\theta}{\tan\theta}}$

11. Evaluate each of the following.

a. $\sec\frac{-43\pi}{6}$

b) $\tan\left(-\frac{28\pi}{3}\right)$

c) $\csc\left(-\frac{21\pi}{9}\right)$

d) $\cot\left(\frac{\log 10000}{\ln e^2}\pi\right)$

12. Given that csc x = $\frac{26}{10}$ for $0\le x\le\frac{\pi}{2}$, evaluate the following (Exact Solutions):

a) cos x b) sin 2x c) $\tan\frac{x}{2}$

13. $x^6-1=0$

Find all the sixth roots of 1

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

15. Given: $f(x)=\sqrt{x}$ Find: $f'(x)$

16. Evaluate each limit.

a) $\lim_{x\to\infty}\frac{7x^2-2x+5x^3-8x^4}{3x^4+15x^3+x-2}$

b) $\lim_{x\to 0}\frac{\sqrt{1+x}-1}{x}$

c) $\lim_{x\to 16}\frac{x-16}{\sqrt{x}-4}$

d) $\lim_{x\to 0}\frac{\frac{1}{x+4}-\frac{1}{4}}{x}$

[redacted] MATH REVIEW – 5
HONORS ALGEBRA 2B

(1) $-3(-2) + 2(-3) + 1 = (2\cos^2\theta - \cos^2\theta + \sin^2\theta)(\csc\theta \tan\theta)$

$6 - 6 + 1$

$1 = (\cos^2\theta + \sin^2\theta)(1)$

$= 1$

(2) (a) $\cos(2\theta + \theta) = \cos^3\theta - 3\sin^2\theta\cos\theta$

$\cos 2\theta \cos\theta - \sin 2\theta \sin\theta$

$(\cos^2\theta - \sin^2\theta)\cos\theta - 2\sin\theta\cos\theta\sin\theta$

$\cos^3\theta - \sin^2\theta\cos\theta - 2\sin^2\theta\cos\theta$

$\cos^3\theta - 3\sin^2\theta\cos\theta$

(b) $\dfrac{2\sin\left(\frac{4\phi+6\phi}{2}\right)\cos\left(\frac{4\phi-6\phi}{2}\right)}{-2\sin\left(\frac{4\phi+6\phi}{2}\right)\sin\left(\frac{4\phi-6\phi}{2}\right)} = \cot\phi$

$\dfrac{\cos(-\phi)}{-\sin(-\phi)}$

$\dfrac{\cos\phi}{\sin\phi}$

$\cot\phi$

(c) SAME AS (a)

(d) $\dfrac{\frac{\cos\theta}{\sin\theta} - \frac{\sin\theta}{\cos\theta}}{\frac{\cos\theta}{\sin\theta} + \frac{\sin\theta}{\cos\theta}}$

$\dfrac{\frac{\cos^2\theta - \sin^2\theta}{\sin\theta\cos\theta}}{\frac{\cos^2\theta + \sin^2\theta}{\sin\theta\cos\theta}}$

$\dfrac{\cos^2\theta - \sin^2\theta}{\cos^2\theta + \sin^2\theta}$

$\cos^2\theta - \sin^2\theta$

(3) $13e^{2x} = 65$

$e^{2x} = 5$

$2x = \ln 5$

$x = \frac{\ln 5}{2}$

$x = 0,8047$

(4) $f(x) = \frac{(x-15)(x+2)}{(x-2)(x+2)}$ V.A. : $x = 2$

HOLE : $(-2, \frac{17}{4})$

(5) $\log(x^2+2x) = \log(3x+6)$

$x^2+2x = 3x+6$

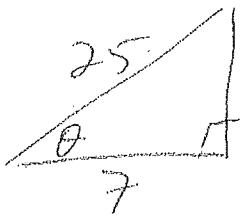
$x^2 - x - 6 = 0$

$(x-3)(x+2) = 0$

$x = 3$

~~$x = -2$~~

(6)



$\sin\theta = \frac{24}{25}$

(7) $2\cos 2\theta + \sqrt{12} = \sqrt{27}$

$2\cos 2\theta = 3\sqrt{3} - 2\sqrt{3}$

$2\cos 2\theta = \sqrt{3}$

$\cos 2\theta = \frac{\sqrt{3}}{2}$

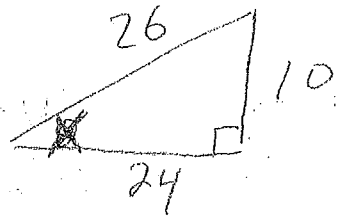
$\theta = \frac{\pi}{6}, \frac{11\pi}{6}$

(8) FALSE (9) TRUE (10) TRUE

(11) (a) $-\frac{2\sqrt{3}}{3}$ (b) $-\sqrt{3}$

(c) $-\frac{2\sqrt{3}}{3}$ (d) UNDEFINED

(12)



(a) $\cos x = \frac{24}{26} = \frac{12}{13}$

(b) $\sin 2x = 2\sin x \cos x = 2\left(\frac{10}{26}\right)\left(\frac{24}{26}\right) = \frac{480}{676} = \frac{120}{169}$

(c) $\tan\frac{x}{2} = \frac{\sin x}{1+\cos x} = \frac{\frac{10}{26}}{1+\frac{24}{26}} = \frac{\frac{10}{26}}{\frac{50}{26}} = \frac{10}{50} = \frac{1}{5}$

(13) $x^6 - 1 \Rightarrow \quad x^6 = 1$

$1 = 1(\cos 0 + i\sin 0) \quad n = 6, \ r = 1$

$\sqrt[6]{1}\left(\cos\frac{0+2\pi k}{6} + i\sin\frac{0+2\pi k}{6}\right) \quad k = 0, 1, 2, 3, 4, 5$

$1, \ \frac{1}{2}+\frac{\sqrt{3}}{2}i, \ -\frac{1}{2}+\frac{\sqrt{3}}{2}i, \ -1, \ -\frac{1}{2}-\frac{\sqrt{3}}{2}i, \ \frac{1}{2}-\frac{\sqrt{3}}{2}i$

(14) $(-1+i\sqrt{3})^{12} = \left[2\left(\cos\frac{2\pi}{3} + i\sin\frac{2\pi}{3}\right)\right]^{12}$

$= 2^{12}\left[\cos\left(12\cdot\frac{2\pi}{3}\right) + i\sin\left(12\cdot\frac{2\pi}{3}\right)\right]$

$= 4096$