1. If $f(x)=\ln(e^x)$, find the value of $f(\sin 30°)+f(\cos 135°)$ to the nearest thousandth.

2. For $64x^2-25y^2+512x+350y-1801=0$, let
$m_1=a$ and $m_2=b$ be the slopes of the asymptotes
the length of one latus rectum be c
the length of the conjugate axis be d
Find $abcd$ to the nearest integer.

3. F = the distance between (-7, 5) and $9x+40y-6=0$.
G = the distance between (2, -1, 4) and $3x+9y-5z+2=0$.
H = the distance between $2x-3y-z+5=0$ and $2x-3y-z+7=0$.
J = the distance between (1, 1) and (2, 1).
Find FGHJ to the nearest hundredth.

4. $g(x)=\dfrac{x^3-9x^2+23x-15}{x-3}$. Statements below about $g(x)$ have values to the left of them. Add the value(s) of the false statement(s) (disregard the true statements).

(-1) $g(x)$ has a removable discontinuity at x = 3.
(2) If $g(x)$ existed at x = 3, the corresponding y-value would be 4.
(5) The limit as x approaches 3 from the left of $g(x)$ equals the limit as x approaches 3 from the right of $g(x)$.
(-2) $\lim\limits_{x\to 3} g(x)$ exists.
(-7) $g(x)$ is continuous at x = 3.

5. Find the exact value of the product of the solutions of
$\cos^2(\ln x)-5\cos(\ln x)-6=0$ on the interval $\left(20, 12400\right]$.

6. $D=\sum_{n=1}^{\infty}\left(\dfrac{8}{3}\right)^{-n}$ $\qquad U=\sum_{x=4}^{89}(x+1)$

C = the number of terms that are added together to simplify $\sum_{k=49}^{317}\left(\dfrac{k\pi}{107}\right)^2$

$K=\log\dfrac{1}{2}+\log\dfrac{2}{3}+\log\dfrac{3}{4}+\ldots+\log\dfrac{98}{99}+\log\dfrac{99}{100}$

Find (the lucky) $DUCK$.

7. $A=$ the sum of the roots of $2x^3+12x^2+15x-10=0$
$B=$ the sum of the roots taken two at a time of $2x^3+5x^2-62x-40=0$
$C=$ the product of the roots of $3x^3+7x^2-18x-360=0$

Find the roots of $x^3+Ax^2+Bx+C=0$. If D, E, and F are the roots, where $D<E<F$, find $D-E-F$.

8. $\lim_{x\to\infty}\frac{3x^2+5x^3+5x-2}{2x^2+4x^3+13x-4}+\lim_{x\to 0}\left(\frac{\sin x}{x}+\frac{\cos x-1}{x}\right)+\lim_{x\to 4}\frac{3}{4}$

9. A new bridge is being constructed that is 35 feet long (horizontally). For the first 20 feet, it is a quarter-ellipse, and for the last 15 feet, it is a quarter circle. The radius of the circle is 15 feet, which is also the length of the semi-minor axis of the ellipse, the tallest point on the bridge. Find the distance 10 feet horizontally from the end of the elliptical side, plus the distance 30 feet from the end of the elliptical side (to the nearest tenth).

10. $\left\|\vec{u}\right\|=5$ and $\left\|\vec{v}\right\|=7$. The tangent of the first-quadrant angle between $\vec{u}$ and $\vec{v}$ is $\frac{3}{4}$. Let

M = $\vec{u}\cdot\vec{v}$

A = the norm of the outer product of $\vec{u}$ and $\vec{v}$

T = the length of $\vec{u}$ H = the length of $\vec{v}$

Find the exact value of MAT + H.

11. Critical points of a function are points on the curve whose x-values are those of the derivative set equal to zero. Find the midpoint of the two critical points of $\frac{1}{3}x^3-x^2-15x+4=0$. Round your ordinate to two decimal places.

12. C = the slope of $3x+5y-2=0$

L = x^2+y^2 if $x+y=10$ and $xy=20$

I = the number of zeros at the end of 600! É = $(1+i)^{12}$

H = the product of the period and the amplitude of $y=3\tan 4x-\pi$

To the nearest integer, find the value of CLICHÉ.

13. $\sum_{x=1}^{52}\left(e^{\ln x^2}+i^x+x^3\right)=$

14. A = the area of a 6, 7, 12 triangle

B = the length of the angle bisector to side c in Triangle ABC if side a = 3, side b = 4, and side c = 5 (round to the nearest hundredth)

C = the number of digits in 3^{63}

D = the number of distinguishable ways of rearranging the letters in WEHTAMRETXAB Find the value of $\frac{\text{ABCD}}{10000}$ to the nearest integer.

15. $A=i^i$ hint (if you need it): use $cis\theta=e^{i\theta}$ $B=\frac{e^{i\frac{3\pi}{4}}\cdot e^{i\frac{5\pi}{6}}}{e^{i\frac{\pi}{2}}}$

$C=(4cis55°)(2cis65°)$ $D=i^{2004!}$

Find $\left|BC\right|+D+A$ to the nearest hundredth.