Mrs. Castello & Mr. Swytak Week 2-4 Precalculus Distance learning
Skills needed to pass Calculus. Good luck! ☺

Name _____
Date _____
Period___

1.) Given the function: $f(x)=\dfrac{2x-1}{x+3}$

a.) Find the equations of all asymptotes.
b.) Find all zeroes.
c.) Use a calculator to graph the function.

2.) Given the following two points $f(2)=3,\ f(-1)=-2$

a.) Find the slope of the secant line between the two points.
b.) Write an equation of the secant line between the two points.

3.) Evaluate the following expressions without a calculator:

$a.)\ (4)^{3/2}$ $b.)\ (27)^{-2/3}$ $c.)\ \left(\dfrac{1}{8}\right)^{1/3}$ $d.)\ 6^{-2}$

$e.)\ (64)^{5/6}$ $f.)\ \sqrt[3]{2}\bullet\sqrt[3]{4}$ $g.)\ (-2)^{3}$ $h.)\ (-16)^{1/2}$

4.) Evaluate the following expressions without a calculator:

$a.)\ \sin\left(\dfrac{3\pi}{4}\right)$ $b.)\ \cos\left(\dfrac{\pi}{6}\right)$ $c.)\ \tan\left(\dfrac{5\pi}{6}\right)$ $d.)\ \sin\left(-\dfrac{4\pi}{3}\right)$

$e.)\ \cos^2\left(\dfrac{\pi}{4}\right)$ $f.)\ \sec\left(\dfrac{5\pi}{3}\right)$ $g.)\ \cot(\pi)$ $h.)\ \sin\left(\dfrac{71\pi}{3}\right)$

5.) Simplify and rewrite the expressions in the form ax^n where a is a constant and n is a rational number:

$a.)\ \dfrac{1}{5x^4}$ $b.)\ \dfrac{4x^8}{8x^4}$ $c.)\ \dfrac{-2x^{-2}}{6x^{-6}}$ $d.)\ 5\sqrt{x}$

6.) Given the relations: $x^2+3x-y=3$ and $x+y=2$.

a.) Find all intersection points of the two relations by hand.
b.) Find all intersection points of the two relations by using a graphing calculator.

7.) Given $f(x)=x^2-4x+5$ and $g(x)=3x-5$, find:

$a.)\ f(-1)$ $b.)\ f(g(x))$ $c.)\ g(f(x))$ $d.)\ f(f(x))$

$e.)\ f'(-1)$ $f.)\ f'(g(x))$ $g.)\ g'(f(x))$ $h.)\ f'(f(x))$

8.) Evaluate the limit:

$a.)\ \lim\limits_{x\to\infty} x^3+2x$ $b.)\ \lim\limits_{x\to\infty}\dfrac{5}{x+1}$ $c.)\ \lim\limits_{x\to\infty}\dfrac{3x-4}{2x+5}$ $d.)\ \lim\limits_{x\to 1}\dfrac{x+3}{x-2}$

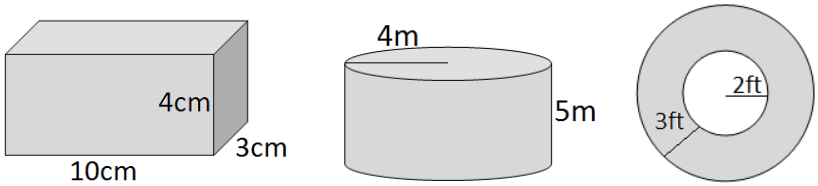
$e.)\ \lim\limits_{x\to -2}\dfrac{x^2-4}{x+2}$ $f.)\ \lim\limits_{x\to 5}\dfrac{x^2-5x}{x^2-6x+5}$ $g.)\ \lim\limits_{x\to 3}\begin{cases} x+6 & x<3 \\ x^2-1 & x>3 \end{cases}$ $h.)\ \lim\limits_{x\to -\infty}\dfrac{4x^2}{-2x+1}$

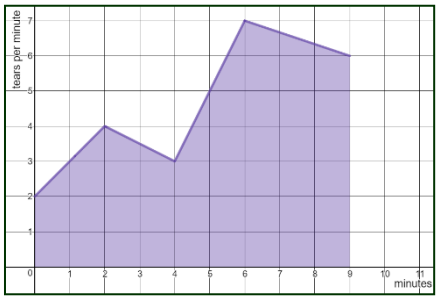
9.) Factor completely:

a.) $9x^2-16$ *b.)* $2x^2-9x-5$ *c.)* x^3+27 *d.)* x^2+9

e.) $10x^3+8x^2$ *f.)* $3x^3+x^2+3x+1$ *g.)* 110 *h.)* x^4-1

10.) Find the area or volume of the given shapes:





11.) Evaluate the logarithm:

a.) $\log_3 9$ *b.)* $\log_2 8$ *c.)* $\log_5\left(\frac{1}{25}\right)$ *d.)* $\ln e$

e.) $\ln(1)$ *f.)* $\log_{1/2}(16)$ *g.)* $\ln\left(e^3\right)$ *h.)* $\log_4(-16)$

12.) Expand the logarithm

a.) $\ln\left(3x^2y^3\right)$ *b.)* $\ln\left(\frac{5x^4}{3x^3}\right)$ *c.)* $\ln(5x)^6$ *d.)* $\ln\left(\frac{1}{\pi}\right)$

13.) Graph the piecewise function.

a.) $f(x)=\begin{cases} x+2, & x>1 \\ 4, & x\le 1 \end{cases}$ *b.)* $g(x)=\begin{cases} -x+2, & x<3 \\ 6, & x=3 \\ 1, & x>3 \end{cases}$ *c.)* $h(x)=\begin{cases} 4, & x=2 \\ 3, & x\ne 2 \end{cases}$

14.) Solve equation using a calculator.

a.) $-x^3+x=\frac{\sin x}{x}$ *b.)* $\cos x = x+2$ *c.)* $x^2+x+1=8$

15.) Solve for *y* (proportions).

a.) $\frac{3y}{4z}=\frac{1}{2x}$ *b.)* $\frac{3}{y}=2x+5$ *c.)* $\frac{4}{7}=\frac{x+1}{xy-2y}$ *d.)* $\frac{1}{y-2}=6x$

e.) $\ln y = x+2$ *f.)* $\ln(y-2)=x^2$ *g.)* $\ln(xy)=x-3$ *h.)* $y^2-6y=x+3$

16.) Rewrite in the form $f(x)=a\bullet x^n,\ a\in,\ n\in$

a.) $\frac{x^{2/3}}{x}$ *b.)* $x\sqrt{x}$ *c.)* $\left(x^{4/3}\right)^{5/2}$ *d.)* $\frac{\sqrt[3]{x}}{\sqrt{x}}$

17.) Terminology and notation:

a.) Understand differences *between* $f(x),\ f(c),\ f'(x),$ *and* $f'(c)$

b.) Understand positive, negative, increasing, decreasing, constant

c.) Understand the difference between an expression and an equation