

NAME: _____

MATH 181 TEST 1 SAMPLE

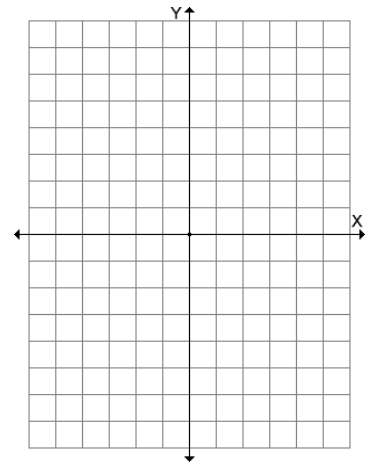
PLEASE SHOW ALL WORK!

1.) (6 pts) Find the intercepts for: $y = 3x^2 + 24x + 48$

x-int: _____

y-int: _____

2.) Graph using transformations: $y = 2 - (x - 3)^3$



3.) Find the equation, in slope-intercept form, of a line that passes through the points $(-5, 4)$ and $(-10, 0)$

3. _____

4.) (4 pts) Find the domain: $y = \frac{x-2}{\sqrt{2x-5}}$
(Express answer in interval notation).

4. _____

5.) (10 points) Find $\lim_{x \rightarrow -3} (3 - 4x)$. Then use the $\varepsilon - \delta$ definition of a limit to prove your answer.

6.) Find the limit: $\lim_{x \rightarrow 0} \left(\frac{\sin^2 x}{1 - \cos x} \right)$

6. _____

7.) Find the exact value: $\lim_{x \rightarrow \frac{5}{2}} \left(\frac{2x^2 - 3x - 5}{2x^2 - 7x + 5} \right)$

7. _____

8.) Find the exact value: $\lim_{h \rightarrow -2} \left(\frac{h + 2}{\sqrt{h^2 + 5} - 3} \right)$

8. _____

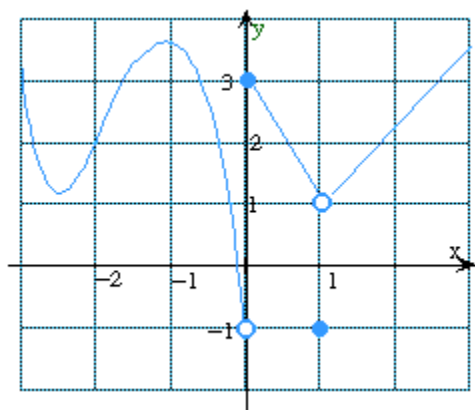
9.) Find the exact value: $\lim_{x \rightarrow 0} \left(\frac{x^2 - x + \sin 8x}{2x} \right)$

9. _____

10.) Find the exact value: $\lim_{\theta \rightarrow \infty} \cos \left(\frac{\sin \theta}{\theta} \right)$

10. _____

11.) (10 pts.) Find the following by using the graph of $f(x)$ below. If it doesn't exist, write d.n.e.



$f(1)$: _____ $f(0)$: _____

$\lim_{x \rightarrow 0^-} f(x)$: _____ $\lim_{x \rightarrow 0^+} f(x)$: _____

$\lim_{x \rightarrow 0} f(x)$: _____ $\lim_{x \rightarrow 1^-} f(x)$: _____

$\lim_{x \rightarrow 1^+} f(x)$: _____ $\lim_{x \rightarrow 1} f(x)$: _____

$\lim_{x \rightarrow -2} f(x)$: _____ $\lim_{x \rightarrow -2} f(x)$: _____

For problems 12 – 14, on the first blank, indicate the x -values (if any) at which f is not continuous. On the second blank, indicate which discontinuity is removable (if any), and on the third blank, indicate which discontinuity is non-removable (if any). If f is continuous, just write “none” in the first blank and don't write anything in the other 2 blanks.

12.) $f(x) = \frac{5x^2 - 13x - 6}{5x + 2}$

12. _____

13.) $f(x) = 2 \tan \theta \cos \theta$ on $[0, \pi]$

13. _____

14.) $f(x) = \frac{x + 5}{x^3 + x^2 - 20x}$

14. _____

15.) Find the limit (if possible): $f(x) = \lim_{x \rightarrow -5^+} \frac{x-3}{x^2 + 2x - 15}$

15. _____

16.) Find the limit (if possible): $g(x) = \lim_{y \rightarrow 4^-} \frac{y+4}{y^2 - 10y - 24}$

16. _____

17.) (4 pts) Find the vertical asymptote
and any holes: $h(x) = \frac{x-3}{x^3 + 27}$

Vertical asymptote: _____

Holes: _____

18.) (6 pts) Find the following infinite limits (if possible):

a.) $\lim_{x \rightarrow \infty} \frac{x^3 + x}{2x^2 - 9}$

18a. _____

b.) $\lim_{x \rightarrow -\infty} \frac{10x-1}{\sqrt{4x+5x^2}}$

18b. _____