Math 1010 March 24, 2017 Sample Test 2

1) What is the domain of $f(x)=\frac{x^2+1}{\sqrt{2x-5}}$?

2) Find the equation of the line through the points (2, 3) and (-6, 9).

3) $f(x)=3x+2$, $g(x)=x^2$ Find f(g(4)).

4) Find the vertex of the parabola $f(x)=x^2-6x-4$.

5) $p(x)=2x^3-x^2+3x+1$. Find p(-2) using synthetic division.

6) Find a polynomial having roots 2, 3, and -7.

7) Find the roots: $(x-3)(x+6)x=0$.

Compute the following.

8) $\ln 32.89$

9) $\log 2.16\times 10^{5000}$

10) $\log_2 3.4$

Solve the following equations for x.

11) $\log_3 4x^2=\log_3 3x+5$

12) $2^{3x-5}=16$

13) $\log_x 49=2$

14) $\log_2 x+\log_2 2=3$

15) $10^{2x}=7$

16) $\ln x+2\cdot\ln 5=\ln 30$

A continuous growth of money problem.

$A=Pe^{rt}$ A = amount after t years P = principal

t = years r = APR

17) Suppose that $1000 is invested at 5% APR compounded continuously. How long till the investment reaches a value of $2000 ?

A general continuous growth problem.

$p=p_0e^{rt}$ p = population after t years p_0 = population when t = 0

t = years r = annual growth rate

The population of India is 1.148 billion (est. July 2008) with an annual growth rate of 1.38%.

18) Assuming India's growth rate remains constant, what will the population of India be in 10 years?

19) Assuming India's growth rate remains constant, in how many more years would India's population reach 1000 billion?

A decay problem.

$y=y_0e^{kt}$ y = amount after t years y_0 = initial amount

t = years $k=\frac{\ln 0.5}{half\ life}$

Suppose that the half-life of an isotope is 8.6 years

20) Find k.

21) How long till 23.2 grams of this isotope decays to 0.07 grams ?