Math 1302 Practice Midterm 2 Fall 2011
Dr. Cordero

NAME_____

1) The polynomial function $p(x) = 3x^5 + 2$ definitely has a zero:

a) Between $x = -2$ and $x = -1$.
b) Between $x = -1$ and $x = 0$.
c) Between $x = 0$ and $x = 1$.
d) Between $x = 1$ and $x = 2$.

2 Find the zeros of the polynomial function and state the multiplicity of each.

$$f(x) = -2x^3(x-5)^2(x+1)$$

a) -2, mult. 3; 5, mult. 2; -1, mult. 1
b) 0, mult. 3, 5, mult. 2, -1, mult. 1
c) 0, mult. 3; -5, mult. 2; 1, mult. 1
d) -2, mult. 3, 5, mult. 2; 1, mult. 1

3) Which polynomial is described by:

Lead Coefficient: 5
Zero at $x = 0$ with multiplicity 1
Zero at $x = -1$ with multiplicity 2
Zero at $x = 2$ with multiplicity 1

a) $5x^4 - 15x^2 - 10x$
b) $5x^3 - 5x^2 - 2x$
c) $5x^4 + 10x^3 - 15x^2 + 10x - 5$
d) $x^5 - 2x^3 - 2x^2 - 3x - 2$

4) Find the quotient of

$x^5 - 1$ divided by $x - 1$.

a) $x^4 + 4x^3 + 6x^2 + 4x + 1$
b) $x^4 + x^3 + x^2 + x + 1$
c) $x^4 + 1$
d) $x^4 - x^3 + x^2 - x + 1$

5) Find the quotient and remainder of $2x^3 + x^2 - 4x + 8$ divided by $x + 3$.

a) $Q(x) = 2x^2 + x - 4,\ R = -25$
b) $Q(x) = 2x^2 + x - 4,\ R = 59$
c) $Q(x) = 2x^2 - 5x + 11,\ R = -25$
d) $Q(x) = 2x^2 + 7x + 17,\ R = 59$

6) Suppose that a polynomial function of degree 5 with rational coefficients has

$$1 - \sqrt{5},\ 1 - 5i,\ 3$$

as zeros. What are the other zeros?

a) $-3,\ 5i,\ \sqrt{5}$
b) $1 - \sqrt{5},\ 1 - 5i$
c) $3 + 5\sqrt{5}i,\ 3 - 5\sqrt{5}i$
d) $1 + \sqrt{5},\ 1 + 5i$

7) Given $f(x) = \frac{2(x+4)(x-6)}{3(x-1)(x+5)}$, what are the asymptotes?

a) Vertical asymptotes at $x = 1$ and $x = -5$, horizontal asymptote at $y = \frac{2}{3}$.

b) Vertical asymptotes at $x = -4$ and $x = 6$, horizontal asymptote at $y = \frac{2}{3}$.

c) Vertical asymptote at $x = \frac{2}{3}$, horizontal asymptotes at $y = 1, y = -5$.

d) Vertical asymptotes at $x = -4$ and $x = -\frac{6}{5}$, horizontal asymptote at $y = \frac{2}{3}$.

8) Given a function $f(x)$ that is one-to-one, $f^{-1}(x)$ is called:

a) f to the negative one of x.
b) f *inverse* of x.
c) one over f of x.
d) the *identity* function of f.

9) Given a one-to-one function $f(x)$,

find $f\left(f^{-1}\left(3x-\frac{1}{2}\right)\right)$

a) $\frac{1}{2}x+3$

b) $3x+\frac{1}{2}$

c) $\frac{1}{3}x+\frac{1}{6}$

d) $3x-\frac{1}{2}$

10) To show that a function f is one-to-one:

a) Assume that since it's on the exam it must be one-to-one.

b) Find the domain and assume it's the range.

c) Find an a and b such that $f(a)=f(b)$, but $a \neq b$.

d) Assume $f(a)=f(b)$, and show that $a=b$.

11) List all possible **rational** zeros of the function

$f(x)=2x^3-3x^2+4x-8$

a) 4, -3, -8

b) $0, \pm 8$

c) $\pm 1, \pm 2, \pm 4, \pm 8$

d) $\pm 1, \pm 2, \pm 4, \pm 8, \pm \frac{1}{2}$

12) Given $g(x)=\sqrt{x+7}$, find $g^{-1}(x)$.

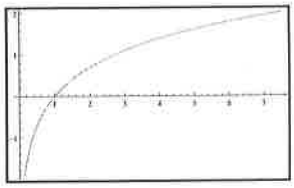
a) $g^{-1}(x)=\sqrt{x-7}$

b) $g^{-1}(x)=x^2-7$

c) $g^{-1}(x)=\frac{1}{\sqrt{x+7}}$

d) $g(x)$ is not one-to-one so $g^{-1}(x)$ does not exist.

13) The graph to the right is:



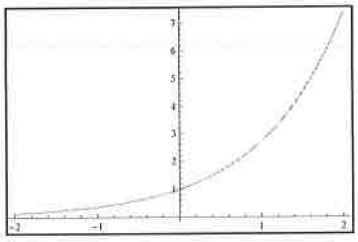
a) Polynomial

b) Logarithmic

c) Exponential

d) Symmetric

14) The graph to the right is:



a) Polynomial

b) Logarithmic

c) Exponential

d) Symmetric

15) Solve and write the solution in interval form:

$|2x+4|<10$

a) $(-\infty,4) \cup (4,\infty)$

b) $(-6,6)$

c) $(-\infty,-7) \cup (3,\infty)$

d) $(-7,3)$

16) Find a rational function that satisfies the following conditions: vertical asymptotes at x=-2 and x=4; horizontal asymptote at y=2/3; x-intercept (2,0)

a) $f(x)=\frac{(x+2)(x+4)}{(x-\frac{2}{3})}$

b) $f(x)=\frac{2(x^2-2)}{3(x+2)(x-4)}$

c) $f(x)=\frac{2(x-2)^2}{3(x+2)(x-4)}$

d) $f(x)=6x+2/3$

17) Find the solution set for: $\frac{x+1}{x-1} \geq 0$

a) $[0, \infty)$

b) $(1, \infty)$

c) $[-1, \infty)$

d) $[-1, 1)$

e) $(-\infty, -1] \cup (1, \infty)$

18) If $log_b 2 = 0.3010$ and $log_b 7 = 0.8451$, what is $log_b 49$?

a) .2544

b) .7142

c) 1.6902

d) 1.002

19) Given $\ln(x + 3) = 1$, solve for x.

a) $x = 3^e$

b) $x = -2$

c) $x = -3$

d) $x = e - 3$

20) Given $\log x = 3$, solve for x.

a) $x = 30$

b) $x = e^3$

c) $x = 1000$

d) $x = \log 3$

21) Given $\ln e^5 - \ln e^2 = x$, solve for x.

a) $x = 3$

b) $x = e^3$

c) $x = 1000$

d) $x = \log 3$

22) Which of these is $\ln \frac{a^3 b}{c^2}$ expressed as a sum and difference of logarithms?

a) $3 \ln a + \ln b - 2 \ln c$

b) $\ln 3a - \ln 2bc$

c) $e^{a^3 bc^{-2}}$

d) $\log a + \log b - \log c$

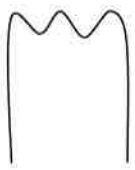
23) Solve $x^2 + x - 2 \leq 0$.

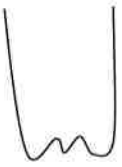
a) $(-\infty, -2) \cup (1, \infty)$ (b) (-2, 1) (c) $[-2, \infty)$ (d) $(-\infty, -2] \cup [1, \infty)$ (e) [-2, 1]

For problems 24 and 25:

a) 

b) 

c) 

d) 

24) Which of the above describes the end behavior of $f(x) = 3x^{39} - 15x^{19} + 20$?

25) Which of the above describes the end behavior of $g(x) = -7x^8 + 18$?