

MATH 125
SPRING 2013
EXAM 3

NAME:

1. 5 pts. each Let $f(x) = \frac{x^2}{x^2 - x - 2}$.
 - (a) Find the domain of f .
 - (b) Find the intercepts of f .
 - (c) Find all vertical asymptotes of f .
 - (d) Find the horizontal or oblique asymptote of f .
 - (e) Find all points where f intersects its horizontal or oblique asymptote.
 - (f) Sketch the graph of f , finding additional points as needed.

2. 10 pts. each Solve the inequality. Where applicable, write the solution set in interval notation.
 - (a) $x^2 + 5x + 6 > 0$
 - (b) $\frac{2x + 1}{x - 5} \leq 3$
 - (c) $x^2 + 12 < 4x$

3. 5 pts. each The compound interest formula is $A(t) = P(1 + r/n)^{nt}$. Suppose that \$750 is invested at 8% interest, compounded quarterly.
 - (a) Find the function for the amount to which the investment grows after t years.
 - (b) Find the amount of money in the account at time $t = 5$ and $t = 10$ years.

4. 5 pts. each
 - (a) Convert $p^k = 3$ to a logarithmic equation.
 - (b) Convert $\log_a M = -x$ to an exponential equation.

5. 10 pts. Express $\ln(x^2 - 9) - \ln(x + 3)$ as a single logarithm, and simplify if possible.

6. 10 pts. each Solve the equation algebraically.
 - (a) $5^{4x-7} = 125$
 - (b) $3^x = 2^{x-1}$
 - (c) $\log_2(10 + 3x) = 5$
 - (d) $\log_2(x + 1) + \log_2(x - 1) = 3$

7. 10 pts. Given that $\tan \varphi = 2$, find the other five trigonometric function values.

8. 10 pts. Convert 67.84° to degrees, minutes, and seconds. Round to the nearest second.
9. 10 pts. To measure the height of a cloud at night, a vertical beam of light is directed at the cloud. From a point on the ground 75 meters away from the light source, the angle of elevation to the illuminated spot on the cloud is determined to be 62.35° . Find the height of the cloud to the nearest meter.
10. 10 pts. Find two positive angles and two negative angles that are coterminal with the angle 109.2° .
11. 10 pts. Given that $\cos \alpha = -\frac{4}{5}$ and α is an angle in Quadrant II, find the other five trigonometric function values. Give exact answers!