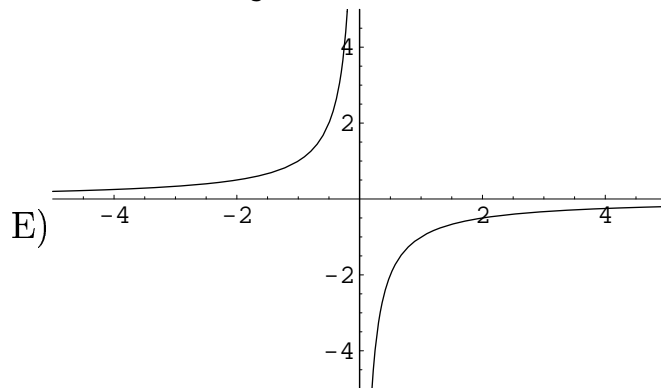
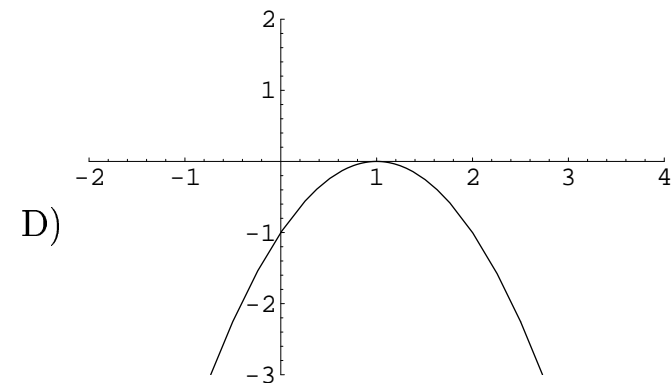
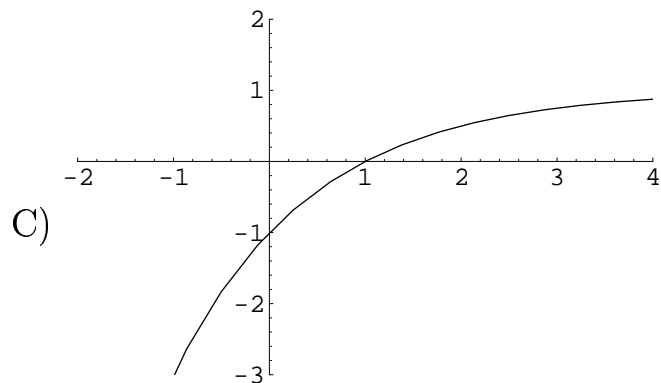
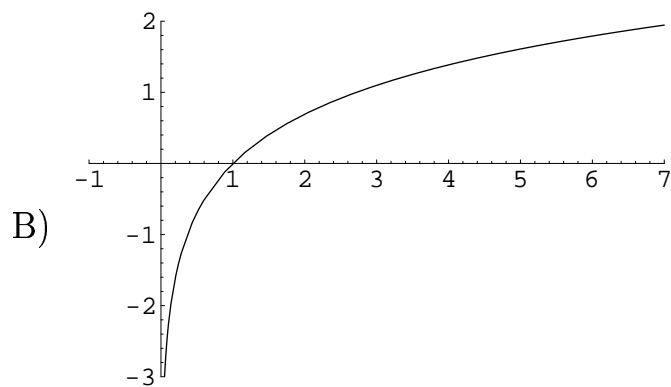
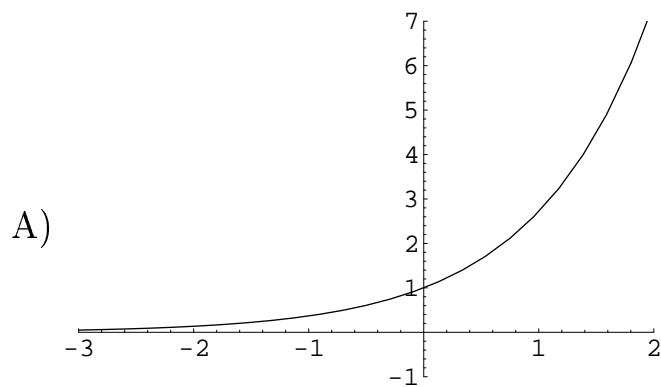


Problem 1 (10 points)

Match these graphs to their functions.



_____ $y = 1 - 2(2^{-x})$

_____ $y = e^x$

_____ $y = -1/x$

_____ $y = \ln x$

_____ $y = -(x - 1)^2$

Problem 2 (10 points)

What is the average rate of change of $y = \sin x$ on the interval $[\pi/2, \pi]$?

What is the average rate of change of $y = \cos x$ on the interval $[0, \pi/2]$?

Problem 3 (10 points)

Find the minimum value of $y = x^4 + 2x^2 + 4$, as well as all x -coordinates where that minimum is attained.

Problem 4 (10 points)

Find all real solutions of the equation $2 \cos \theta + \sin^2 \theta = 1$.

Problem 5 (10 points)

Simplify, eliminating all exponents (and radical signs):

$$\log \left(\frac{10(x+2)^3(x-1)^3}{(x+4)^{1/2}} \right)$$

Problem 6 (10 points)

What is the reference angle of $5\pi/6$?

Evaluate the following:

$$\sin \frac{5\pi}{6}$$

$$\cos \frac{5\pi}{6}$$

$$\sec \frac{5\pi}{6}$$

Problem 7 (10 points)

Graph

$$y = \frac{x}{(x-1)^2(x+1)(x+2)}$$

Identify vertical and horizontal asymptotes and any intercepts or other points of interest that you can.

Problem 8 (10 points)

Given that $\pi/2 < \theta < \pi$ and $\tan \theta = -3/2$, find:

- $\sin \theta$
- $\cos \theta$
- $\sin 2\theta$

Problem 9 (10 points)

Find $\sin 15^\circ$.

Problem 10 (*10 points*)

Find the domains of the following functions:

$$f(x) = \sqrt{16 - x^2}$$

$$g(x) = \log(1 - 2x)$$

Problem 11 Many years ago, I sailed the Cartesian Sea with a crew of swarthy mathematicians. We set out one day from the origin, and headed straight for $(30,10)$. Our maps show a big rock at $(1,7)$ —big enough to sink a ship. How close did we get to the rock, and where were we at the time?