

Applied Calculus I Practice Problems for Quiz # 2

1. Solve for x : $4 \cdot 2^{2x-1} - 3 \cdot 5^x = 0$.
2. Determine which function has a larger value as $x \rightarrow \infty$:
 - (a). $f(x) = 5 \cdot x^2 - 57x$ or $g(x) = 0.002 \cdot (1.001)^x$
 - (b). $f(x) = \log^4 x$ or $g(x) = 3 \cdot \log^2 x^3$
3. Find the inverse function of $y = g(t) = 3e^{t+4} - 2$.
4. Let $y = h(x) = \frac{2}{3-e^{-x}}$.
 - (a). Is h increasing or decreasing?
 - (b). Find a formula for $h^{-1}(u)$.
5. As a new-born infant, Joe was exposed to radioactive strontium-90 in 1968. The half-life of strontium-90 is 29 years. From age 10 to age 20, what was the percentage decrease in the quantity of strontium-90 in Joe's bones? (For example, if Joe had 20 mg in his bones at age 10 and had 15 mg in his bones at age 20, there was a 25% decrease in the quantity, from 20 mg to 15 mg.)
6. Find the equation of a line of slope 1 that is at distance 1 from the origin? (The distance from the origin to a line L is the distance from the point $(0,0)$ to the point, p , on L that is closest to $(0,0)$ among all points on L .)

How many such lines are there?
7. Let $f(x) = 2^x$ and $g(x) = x^3 - 7$.
 - (a). Determine $g(f(y))$.
 - (b). Which function has a larger value as $x \rightarrow \infty$: $g(f(x))$ or $f(g(x))$?
8. Plot $f(x) = -3 \cos(x - \pi)$. Be sure to mark important points on the axes!