

**Math 111**  
**Exam 2 Answers**

1. (a) \$2500

(b) 4%

(c)  $B(10) = 2500(1.04)^{10} = \$3700.61$

(d) Exact Answer:  $t = \frac{\log 4}{\log 1.04}$  or  $\frac{\ln 4}{\ln 1.04}$       Approximate Answer:  $t \approx 35.346$  years

(Solve  $10000 = 2500(1.04)^t$ )

2.  $x = 6$       ( $\log_x 216 = 3 \Rightarrow x^3 = 216$ )

3. Exact Answer:  $t = \frac{\log \frac{1}{2}}{\log 0.7874}$  or  $\frac{\ln \frac{1}{2}}{\ln 0.7874}$       Approximate Answer:  $t \approx 2.9$  years

4. (a)  $x > -4$       (Must have  $2x + 8 > 0$  for the natural log to be defined)

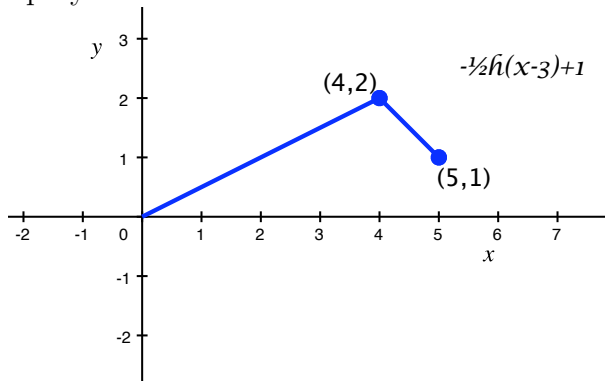
(b) Here's one possible answer:  $u(x) = \ln x$ ,  $v(x) = 2x + 8$

5. The maximum height occurs when  $t = \frac{-40}{2(-2.67)} = \frac{40}{5.34}$  seconds.

The maximum height is  $h(\frac{40}{5.34}) \approx 149.8113$  feet.

6. (a)  $-9 \leq x \leq 6$       (Since the original domain is  $-3 \leq x \leq 2$  and we are stretching  $h(x)$  horizontally by 3)

(b) Transformations: Shift right by 3, Vertically compress by  $\frac{1}{2}$ , Reflect over the  $x$ -axis, Shift up by 1



7.  $\frac{f(x+h)-f(x)}{h} = 2x + h$  (Note:  $f(x+h) = (x+h)^2 + 1$ )

8.  $g(x) = 8(1.5)^x$  (Using the points (0,8) and (2,18))