

Math 111 Quiz #5 Answer

1. (a) I
- (b) III
- (c) II
- (d) IV

2. $\log_2 16 = \boxed{4}$ (since $2^4 = 16$)

3. Solve $40(3)^x + 5 = 25$. (Give the exact answer **and** use your calculator to find the approximate decimal answer.)

There are many ways to do this problem. Here is one way:

Subtracting 5: $40(3)^x = 20$

Dividing by 40: $3^x = \frac{1}{2}$

Taking the log of both sides: $\log(3^x) = \log(\frac{1}{2}) \Rightarrow x \log 3 = \log(\frac{1}{2})$

Dividing by $\log 3$: $x = \frac{\log(1/2)}{\log(3)} \approx \boxed{-0.6309}$

Note: If you used natural log: $x = \frac{\ln(1/2)}{\ln(3)}$

4. (a) $B(3) = 1000(1.15)^3 \approx \boxed{\$1520.88}$

(b) We need to solve $1000(1.15)^t = 4045$.

Dividing by 1000: $1.15^t = 4.045$

Taking the log of both sides: $\log(1.15^t) = \log(4.045) \Rightarrow t \log 1.15 = \log(4.045)$

Dividing by $\log 1.15$: $t = \frac{\log(4.045)}{\log(1.15)} \approx \boxed{10 \text{ years}}$

Note: If you used natural log: $t = \frac{\ln(4.045)}{\ln(1.15)}$