

Quiz 2 MAT116 Last Name: _____ First _____

Show all work for full credit. BOX your final answers!

1) [10] Compute the value of $\sum_{i=2}^4 (i^2 + 2i)$. Show all work and calculations.

$$\begin{aligned} & (2^2 + 2(2)) + (3^2 + 2(3)) + (4^2 + 2(4)) \\ &= (4 + 4) + (9 + 6) + (16 + 8) \\ &= 8 + 15 + 24 \\ &= 47 \end{aligned}$$

2) [20] Casey is unable to make payments on a business loan so the bank needs to decide whether to foreclose on the loan or attempt a workout. From past records, they know the probability of a successful loan workout in similar circumstances is 0.38. The full amount of the loan is \$5 Million. The default value is \$1 Million. If they foreclose today, they estimate they will get back \$2.35 Million. Based only on this information, should they foreclose or workout? Clearly justify your decision.

Define your random variable: $W = \text{amount gained from a workout attempt}$

$$\begin{aligned} E(W) &= 0.38(\$5M) + 0.62(\$1) \\ &= 1.9 + 0.62 = 2.52 \$M \end{aligned}$$

$$\$2.52M > \$2.35$$

\therefore We should attempt a workout

3) [20] Suppose a casino has a game where a person spins a wheel with 50 slots on it. One (1) of them is a \$1000 payout. Four (4) of them are \$100 payouts. Ten (10) of them \$5 payoff. Fifteen (15) of them are \$1 payouts. The rest are \$0 payouts. If the casino charges a \$20 bet to play the game, how much can the casino expect to make if 20,000 bets are made on this game per week?

Define your random variable: $X = \text{amount the casino will payout in a game}$

$$E(X) = -1000\left(\frac{1}{50}\right) - 100\left(\frac{4}{50}\right) - 5\left(\frac{10}{50}\right) - 1\left(\frac{15}{50}\right) - 0\left(\frac{20}{50}\right)$$
$$= -29.3$$

But they charge \$20 per game

$$\text{So } -29.30 + 20.00 = -9.30 \text{ per game}$$

So for 20,000 games they would lose $(20,000)(-9.3) = -186,000$
ouch!