MATH 1324 MLM Final Exam Formula Sheet

A standard deck of 52 cards has four 13-card suits: diamonds, hearts, clubs, and spades. The diamonds and hearts are red, and the clubs and spades are black. Each 13-card suit contains cards numbered from 2 to 10, a jack, a queen, a king, and an ace. The number or letter on a card indicates its *rank*. So there are 13 ranks and 4 cards of each rank. The jack, queen, and king are called *face cards*. (The ace is *not* a face card.) Depending on the game, the ace may be counted as the lowest and/or the highest card in the suit. In traditional card games, a *hand* of cards is an unordered subset of the deck.

$$P(E) = \frac{\text{number of elements in } E}{\text{number of elements in } S} = \frac{n(E)}{n(S)}$$

Odds for $E = \frac{P(E)}{1-P(E)} = \frac{P(E)}{P(E')}$

Odds against $E = \frac{P(E')}{P(E)}$

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

$$E(X) = x_1p_1 + x_2p_2 + \cdots + x_np_n$$

$$P(A \cap B) = P(A)P(B)$$

$$P(A|B) = \frac{P(A \cap B)}{P(B)}$$

$P(A|B) = P(A)$ and $P(B|A) = P(B)$

Quadratic Formula: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Vertex Formula: $x = h = \frac{-b}{2a}$; $y = k = f(h)$

Logarithmic Formulas:

If b, M, and N are positive real numbers, $b \neq 1$, and p and x are real numbers, then

1. $\log_b 1 = 0$
2. $\log_b b = 1$
3. $\log_b b^x = x$
4. $b^{\log_b x} = x, \quad x > 0$
5. $\log_b MN = \log_b M + \log_b N$
6. $\log_b \frac{M}{N} = \log_b M - \log_b N$
7. $\log_b M^p = p \log_b M$
8. $\log_b M = \log_b N$ if and only if $M = N$

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In all problems involving days, use days given in MLM and round as directed in the question (make sure to not round until the end).

$i = \frac{r}{m}$ $\quad$ $n = mt$

$A =$ amount or future value
$P =$ principal or present value
$r =$ annual nominal rate (or just rate)
$m =$ number of compounding periods per year

Simple Interest: $A = P(1 + rt)$

Compound Interest: $A = P\left(1 + \frac{r}{m}\right)^{mt}$

Continuous Compound Interest: $A = Pe^{rt}$

Annual Percentage Yield (compound): $\text{APY} = \left(1 + \frac{r}{m}\right)^{m} - 1$

Future Value Annuity Formulas

$$FV = PMT\frac{(1+i)^n - 1}{i}$$

$$PMT = FV\frac{i}{(1+i)^n - 1}$$

Present Value Annuity Formulas

$$PV = PMT\frac{1-(1+i)^{-n}}{i}$$

$$PMT = PV\frac{i}{1-(1+i)^{-n}}$$