

(20 pts) NAME (printed neatly): \_\_\_\_\_

Quiz Grade: \_\_\_\_\_

1. (20 pts) If  $A$  and  $B$  are independent events where  $P(A) = 0.34$  and  $P(B) = 0.56$ , find  $P(A \cup B)$ .

$$\begin{aligned} P(A \cup B) &= P(A) + P(B) - P(A \cap B) = P(A) + P(B) - P(A)P(B) \\ &= 0.34 + 0.56 - (0.34)(0.56) = 0.7096 \end{aligned}$$

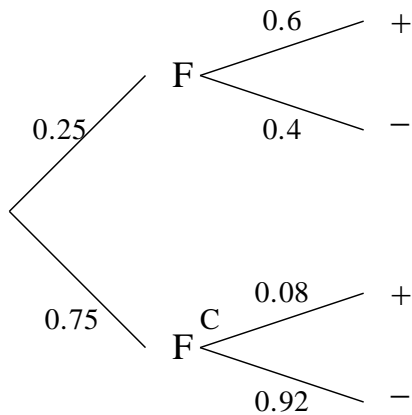
[Note: Events  $A$  and  $B$  are independent iff  $P(A \cap B) = P(A)P(B)$ .]

2. (20 pts) Sixty percent of basketball fans with Final Four Frenzy will test positive for Final Four Frenzy and 8% of fans without Final Four Frenzy will also test positive for Final Four Frenzy. A basketball fan has a 25% chance of having Final Four Frenzy. If a basketball fan has a positive Final Four Frenzy test, what is the exact probability, as a fraction in lowest terms, that he or she actually has Final Four Frenzy? Hint: A probability tree diagram is considered part of your work.

 $F$  = has Final Four Frenzy

+ = tests positive for Final Four Frenzy

- = tests negative for Final Four Frenzy



$$P(F|+) = \frac{P(F \cap +)}{P(+)} = \frac{(0.25)(0.6)}{(0.25)(0.6) + (0.75)(0.08)} = \frac{5}{7}$$

3. (10 pts) A card is drawn and replaced from a standard deck of 52 until the ace of hearts is drawn. Circle the type of random variable associated with this experiment.
- Finite discrete
  - Infinite discrete**
  - Continuous
4. A gardener examined 60 peach trees and counted the number of ripe peaches on each tree. The results are summarized in the table below.

Number of peach trees	12	18	20	10	<b>L2</b>
Number of peaches per tree	25	30	35	40	<b>L1</b>

- a. (10 pts) What is the average number, to 2 decimal places, of peaches per tree? Remember your units!

1-VarStats L1, L2

$\bar{x} \approx 32.33$  peaches per tree

**OR** mean is  $\frac{25 \cdot 12 + 30 \cdot 18 + 35 \cdot 20 + 10 \cdot 40}{12 + 18 + 20 + 10} = \frac{97}{3} \approx 32.33$  peaches per tree

- b. (10 pts) What is the median to 2 decimal places?

32.50 peaches per tree

- c. (10 pts) What is the mode?

35 peaches per tree

- d. 10 point bonus: What is the variance, to 2 decimal places?

$Var(X) = \sigma^2 \approx (4.955356249)^2 \approx 24.55$