Name: Solutions Period: _____

Checkpoint 8C and 8D *Integrated Math 2*

Include all necessary math work or explanations for each question.

1) Alex gave a survey to 100 classmates and records his information in a two way table. However, he forgot to fill in some of the results. Complete the table.

	Read the book	Did not read the books	Totals
Saw the movie	20	40	60
Did not see the movie	10	30	40
Totals	30	70	100

2) Use the information in the table above to answer the following questions.

a) How many people did not read the book or see the movie? 30

b) How many people saw the movie? 60

c) How many people saw the movie and read the book? 20

3) A survey was given to a doctor's patients who caught a cold one winter and whether or not they exercised regularly. Use the table to answer the questions.

	Caught a cold	Did not catch a cold	Totals
Exercised	8	30	38
Did not exercise	10	2	12
Totals	18	32	50

a) How many patients were surveyed? 50

b) How many patients exercised? 38

c) What's the probability that a randomly chosen patient caught a cold and did not exercise? $10/50 = 1/5$

d) What is the probability that a randomly chose patient exercised and did not catch a cold? $30/50 = 3/5$

4) A survey was given to boys and girls in regards to whether or not they played tennis. Use the table to find the probabilities.

	Has played tennis	Has not played tennis	Totals
Boys	10	6	16
Girls	10	4	14
Totals	20	10	30

a) P(girl) $14/30 = 7/15$

b) P(has not played tennis) $= 10/30 = 1/3$

c) P(has not played tennis given she is a girl) $= 4/14 = 2/7$

d) P(played tennis given he is a boy) $= 10/16 = 5/8$

5) A biologist surveyed a type of plant growing on a wooded acre. Use the table to find the probabilities.

	Lobed Leaves	Non-lobed Leaves	Totals
Red Berries	12	48	60
No Red Berries	40	0	40
Totals	52	48	100

a) P(lobed leaves) $= 52/100 = 13/25 = 0.52$ or 52%

b) P(red berries | lobed leaves) $= 12/52 = 3/13$

c) P(red berries) $= 60/100 = 3/5 = 0.6$ or 60%

d) P(lobed leave | red berries) $= 12/60 = 1/5 = 0.2$ or 20%

6) Of the people who went to an amusement park last week, 85% rode a rollercoaster, 45% attended a musical review show, and 18% did both.

a) What is the conditional probability that a person who rode a rollercoaster also attended a musical review show?

A: rode rollercoaster
B: attended musical review

$P(B|A) = \frac{P(A \text{ and } B)}{P(A)} = \frac{0.18}{0.85} = 0.2118$ or 21.18%

b) Explain the meaning of P(rode a rollercoaster | attended musical review). Then calculate the probability.

Out of all people who attended musical review, the question asks for the probability of a person riding roller coaster.

$P(A|B) = \frac{P(A \text{ and } B)}{P(B)} = \frac{0.18}{0.45} = 0.40$ or 40%

7) Half of your 200 classmates went to the zoo. Of the students who went to the zoo, 25% saw the dolphin show. Explain how to calculate the number of students that attended the dolphin show.

100 people went to zoo

100(0.25) = 25 students attended dolphin show

50%

8) At a recent swim meet, half of the swim club members experienced an improvement in their race times over a previous swim meet. The probability of a swim club member experiencing an improvement in their race time and training the week before the meet was 30%.

a) What is the probability that a swimmer trained the week before the meet given that his or her race time improved?

A: Swimmer trained
B: race time improved

$P(A|B) = \frac{P(A \text{ and } B)}{P(B)} = \frac{0.30}{0.50} = \frac{3}{5} = 0.60$ or 60%

b) The probability that a swimmer did not experience an improvement in his or her race times and trained the week before the meet was 10%. What is P(trained | did not improve)?

$P(\text{trained} | \text{did not improve}) = \frac{P(\text{trained and did not improved})}{P(\text{did not improve})} = \frac{0.10}{0.50} = \frac{1}{5} = 0.20$ or 20%

50%

9) Half of a class took Form A of a test, and half took Form B. Of the students who took Form B, 39% passed. What is the ~~conditional~~ probability that a randomly chosen student took Form B and passed?

$P(\text{passed} | \text{took Form B}) = \frac{P(\text{passed and took Form B})}{P(\text{took Form B})}$

$0.39 = \frac{x}{0.5} \Rightarrow 0.5 \cdot 0.39 = x = 0.195$ or 19.5%

$\therefore P(\text{Form B and Pass}) = 0.195$ or 19.5%

10) 75% of a research team worked in a lab while 25% of the team worked near a pond. Of the researchers who worked near the pond, 14% collected insects. What is the probability that a randomly chosen researcher worked near the pond and collected insects?

$P(\text{collect insects} | \text{work near pond}) = \frac{P(\text{collect insects and work near pond})}{P(\text{work near pond})}$

$P(\text{collect and pond}) = 0.035$ or 3.5%

$0.14 = \frac{x}{0.25} \Rightarrow x = 0.14 \cdot 0.25 = 0.035$ or 3.5%

11) The probability of drinking water on a long hike is 0.85, and the probability of eating trail mix is 0.42. If the probability of drinking water given that you eat trail mix is 0.95, is drinking water independent of eating trail mix? Justify your answer with math.

A: water
B: trail mix

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

$0.95 \neq 0.85$

$\therefore A, B$ not independent

12) The probability of going to the pool on a hot summer day is 0.65. The probability of splashing a lifeguard is 0.08. If the probability of splashing a lifeguard given that it's a hot summer day is 0.18, is going to the pool independent of splashing a lifeguard? Justify your answer with math.

A: splashing lifeguard
B: Summer day (Hot)

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

$0.18 \neq 0.08$

$\therefore A, B$ not independent