Additional Pilot Information for Teachers

Ruth

Flight Number	Origination City	Departure Time	Destination City	Arrival Time	Flight Length
767	Phoenix	8:00a.m.	Seattle	9:45a.m.	2.75 hours
268	Seattle	10:30a.m.	Los Angeles	1:15p.m.	2.75 hours
465	Los Angeles	1:45p.m.	Seattle	4:15p.m.	2.5 hours
Layover In Seattle					

Leg 1: What is the likelihood that Ruth will depart Phoenix in time to fly to Los Angeles? (Be sure to explain your calculations.)

Ruth has a 45-minute layover in Seattle before flying to Los Angeles. Therefore, her departure from Phoenix must **not** be delayed more than 45 minutes.

a. What is the likelihood that Ruth will have a delayed departure from Phoenix?

(# Departure Delays) ÷ #Total Departures =

(# Air Traffic Delays + # Weather Delays) ÷ # Total Departures = (21 + 4) ÷ 144 = 25 ÷ 144 =

0.174 or 17.4%

b. If there is a delay in Phoenix, what is the likelihood that it will be more than 45 minutes?

(# delays > 45 minutes) ÷ (# of delays) =

(# delays 46 – 60 minutes + # delays 61 – 75 minutes + # delays 76 – 90 minutes + # delays > 90 minutes) ÷ (# Air Traffic Delays + # Weather Delays) =

(7 +6 + 5 + 3) ÷ (21 + 4) = 21 ÷ 25 = 0.84 or 84%

c. What is the likelihood that Ruth will have a delay of more than 45 minutes?

(likelihood of a late departure) x (likelihood of the departure being > 45 minutes) =

17.4% x 84% = 0.174 x 0.84 = 0.1462 or 14.6%

OR

((21 delays due to air traffic + 4 delays due to weather) ÷ 144 total departure flights) x ((7 delays 46 – 60 minutes + 6 delays 61 – 75 minutes + 5 delays 76 – 90 minutes + 3 delays > 90 minutes) ÷ (21 Air Traffic Delays + 4 Weather Delays)

= (25 ÷ 144) x (21 ÷ 25) = (0.174) X (0.84) = 0.1462 or 14.6%

d. What is the likelihood that Ruth will depart Phoenix in time to fly to Los Angeles?

100% - 14.6% = 85.4%

Ruth has an 85.4% chance of departing Phoenix on time.

Leg 2: What is the likelihood that Ruth will depart Seattle in time to fly back to Seattle?

Ruth has a 30-minute layover in Los Angeles before flying back to Seattle. Therefore, her departure from Seattle must **not** be delayed more than 30 minutes.

(likelihood of a late departure) x (likelihood of the departure being > 30 minutes) =

((21 delays due to air traffic + 29 delays due to weather) ÷ 173 total departure flights) x ((6 delays 31 – 45 minutes + 12 delays 46 – 60 minutes + 11 delays 61 – 75 minutes + 11 delays 76 – 90 minutes + 7 delays > 90 minutes) ÷ (21 Air Traffic Delays + 29 Weather Delays))

= (50 ÷ 173) x (47 ÷ 50) = (0.289) x (0.94) = 0.2717 or 27.2%

Therefore, the likelihood that she will arrive in time is 100% - 27.2% or 72.8%.

Fill in the table below with the results of your computations.

Ruth

Flight Number	Origination City	Departure Time	Destination City	Arrival Time	Flight Length	Likelihood of On-Time Departure	Accumulated Likelihood
767	Phoenix	8:00a.m.	Seattle	9:45a.m.	2.75 hours	85.4%	85.4%
268	Seattle	10:30a.m.	Los Angeles	1:15p.m.	2.75 hours	72.8%	62.2%
465	Los Angeles	1:45p.m.	Seattle	4:15p.m.	2.5 hours		
Layover In Seattle							

If a pilot has less than a 75% chance of arriving in time for the next flight, a standby pilot must be ready to fly. Will a delayed arrival or departure for Ruth reach a point at which a standby pilot must be scheduled?

Because the likelihood of Ruth's departing Seattle in time to make the return flight is less than 75 percent, a standby pilot should be scheduled for her flight from Los Angeles to Seattle.

A standby pilot is called when the accumulated (compound) probability of arriving in time drops below 65%. Will the accumulated chance of a delayed arrival or departure for Ruth reach a point at which a standby pilot must be scheduled? If so, for which flight do you need a standby pilot?

Yes, the accumulated likelihood that Ruth will depart Seattle on time to make her return flight is 62.2%. 62.2% < 65%, so a standby pilot should be called to fly from Los Angeles to Seattle (though note that one has already been called due to the individual flight calculation).