Answers to the Probability Problems on the back of the Math Award Learning Task

13. Football Plays Problem:

a) 12% b) 28% c) 48% d) 12% (Note that the total is 100%)

14. Operation Problem

a) 63% b) 18% c) 7% d) 12% (Total is still 100%)

15. Measles and Chicken Pox Problem

a) 2.4% b) (i) 5% (ii) 90%

c) Measles seems to give immunity to chicken pox, but chicken pox seems to increase the susceptibility to measles.

16. Airplane Engine Problem

a) 0.09% b) 20% c) The engines do NOT seem to operate independently of each other. If one fails the other is more likely to fail. (Is that due to the excess stress on the engine?)

3. Thumbtack Problem

a) (Consider (.3 + .7)4 …) p(0) = 0.0081, p(1) = 0.0756, p(2) = 0.2646, p(3) = 0.4116 and p(4) = 0.2401

b) Graph (#”up”, p(#”up”) )

c) p(greater than 2)= 0.6517 and p(at most 2) = .3483, so more than 2 up is most probable.

4. Traffic Light Problem

a) p(0) = .216, p(1) = .432, p(2) = .288 and p(3) = .064 b) Graph (#”red”, p(#”red”) )

c) p(more than 1 red) = 35.2%, p(1 or less red) = 64.8%, so you are more likely to be stopped at 1 or fewer lights.

5. Bull’s Eye Problem

a) p(0) = .16807, p(1) = .36015, p(2) = .30870, p(3) = .13230, p(4) = .02835, and p(5) = .00243

b) Graph (#”Bull’s eyes”, p(#”Bull’s eyes”) ) c) p(at least 2) = .47178

6. Combination and Binomial Series Problem

a) n(0) = 1, n(1) = 5, n(2) = 10, n(3) = 10, n(4) = 5 and n(5) = 1 b) Sum = 32

c) (1 + 1)5 = 1 + 5 + 10 + 10 + 5 + 1 = 32 d) (1 + 1)5 = 25 = 32 e) 210 = 1024