1

1. Odds is p/(1-p). logit(p) = log(p/(1-p)) = log(o)
2. P = logit^-1(x) = s(x) = 1/(1+e^-x)
3. S(100) = 1/(1+e^-100) ~ 1.00 S(-100) = 1/(1+e^100) ~ 0.00 S(10) = 1/(1+e^-10) ~ 1.00 S(-10) = 1/(1+e^10) ~ 0.00 S(0) = 1/(1+e^0) ~ 0.5
4. S’(x) = e^-x/(1+e^-x)^2 S’(100) = e^-100/(1+e^-100)^2 ~0 S’(-100) = e^100/(1+e^100)^2 ~0 S’(10) = e^-10/(1+e^-10)^2 ~0 S’(-10) = e^10/(1+e^10)^2 ~0 S’(0) = e^0/(1+e^0)^2 = 0.25

2

3

1. (1) p(1) = 1/50 p(2 ) = 6/50 p(3) = 12/50 p(4) = 5/50 p(5) = 2/ 50 p(6) = 8/50 p (7) = 12/50 p(8) = 4/50

q(1) = 1/50 p(2 ) = 3/50 p(3) = 6/50 p(4) = 8/50 p(5) = 15/ 50 p(6) = 10/50 p (7) = 5/50 p(8) = 2/50

(2) KL(p||q) = 1/50log(1/50 / 1/50) + 6/50log(6/50 / 3/50) … = 0.352

KL(q||p) = 0.484

(b)

4

(1) 1.580

(2) 1.040