1. Answer the following?
   a. (4,4) does not contain so it is not reflexive
   b. (3,1) contains but (1,3) does not so it is not symmetric
   c. (2,1) and (1,2) belongs to R but (2,2) does not belong to R so it is not transitive
   d. ---
      i. (4,4) does not contain so not reflexive
      ii. For all (x,y) belongs to R (y,x) belongs to R so it is symmetric
      iii. For all (a,b) and (b,c) belongs to R, there's (a,c) belongs to R so it is transitive
   e.
   $$\begin{matrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 0 \end{matrix}$$

2. R (11,11),(11,12),(11,13),(11,4),(11,5),(12,12),(12,4),(12,5),(13,13), (13, 4), (13, 5), (4, 4), (4, 5), (5, 5)}
   a. Reflexive: All loops so TRUE
   b. Symmetric: (11,4) belongs to R but (4,11) does not so not TRUE
   c. Transitive: All (a,b) and (b,c) belongs to R there's (a,c) belongs to R

3. { (2,2), (2,4), (2,6), (2,8), (2,12), (2,18), (3,3), (3,6), (3,9), (3,12), (3,18), (4,4), (4,8), (4,12), (6,6), (6,12), (8,8), (9,9), (12,12), (18,18) }

4. – Check

   a. Reflexive: TRUE
   b. Symmetric: FALSE
   c. Transitive: (b,a) and (a,d) is there but (b,d) is not : FALSE
   d. Equivalence: FALSE
   e. Antisymmetric: FALSE
   f. Irreflexive: FALSE
   g. Asymmetric: FALSE

5. --- 1
   --- 31

6.
$$f^{-1}(x) = \frac{x}{1-x}$$
$$g^{-1}(x) = \frac{x+3}{9}$$
$$fog(x) = \frac{9x-3}{9x-2}$$
$$gof(x) = \frac{6x-3}{x+1}$$

7. ----- 60
8. 5x-2
9.
   a. Yes, mutually exclusive because green and blue candy can't occur simultaneously
      P(green) + P(blue) = 1/5
   b. Yes, mutually exclusive because yellow and red candy can't occur simultaneously
      P(yellow) + P(red) = 2/5
   c. P(not purple) = 1-P(purple) = 1 – 1/5 = 4/5
10. .
    a. Yes, independent because green die doesn't affect the outcome of red die
    b. 1/6 * 1/6 = 1/36
    c. 1/6 * 1/6 = 1/36
    d. 1/6 * 1/6 + 1/6 * 1/6 = 1/36 + 1/36 + 1/18
11. .
    a. 5/36 {(1,5), (5,1), (3,3), (2,4), (4,2)}
    b. 3/36 {(1,3), (3,1), (2,2)}
    c. 5/36 + 3/36 = 2/9
       Yes, mutually exclusive because sum of 6 and sum of 4 does not occur simultaneously
12. .
    a. No, they're dependent because taking out the first card affects the outcome of the second card
       eg: If ace comes up in the first card i.e. 1/13 then the second ace will have probability of 3/51
    b. 4/52*4/51
    c. 4/52 * 4/51
    d. P (ace and king) or P(king and ace) = 32 / (52*51)
13. .
    a. Yes, they're independent because taking out the first card does not affect the outcome of the second card
       eg: If ace comes up in the first card i.e. 1/13 then the second ace will also have probability of 1/13
    b. 4/52*4/52
    c. 4/52 * 4/52
    d. P (ace and king) or P(king and ace) = 32 / (52*52)
14. .
    a. *Calculate yourself*
    b. *Calculate yourself*
15. 15P3 because the you take 3 nurses and arrange then to the different positions 1,2 & 3

16. 10P3 similar to question 15
17. 10P3 similar to question 15
18. 10P3 because you are suggesting 3 movies from 10 and then arranging them to different ranks