## Analysis - Semester One Review MC

## The following information applies to 1-4.

All students in a school take both mathematics and English. The probability of a student, chosen at random, failing mathematics is 0.15. The probability of a student, chosen at random, failing English is 0.05. The probability that a students is failing both mathematics and English is 0.04.

1. If a student, chosen at random, is failing English, what is the probability that the student is also failing mathematics? a) .85 b) .36 c) .28 d) .8 2. What is the probability that a randomly chosen student is NOT failing mathematics? a) .85 b) .36 c) .28 d) .8 3. Are the events "failing mathematics" and "failing English" independent events? a) Yes b) No c) More information is needed to be sure 4. Are the events "failing mathematics" and "failing English" mutually exclusive? a) Yes b) No c) More information is needed to be sure 5. Which of the following is the value of the geometric series  $1 + \frac{1}{5} + \frac{1}{25} + \dots + \frac{1}{5^n} + \dots$ ?  $d) 5\left(\frac{1}{1-\frac{1}{5}}\right)$ a)  $\frac{1-5^n}{1-5}$  b)  $\frac{1}{5^n}$  c)  $\frac{1}{1-\frac{1}{5}}$ 6. What is the missing entry in the 12<sup>th</sup> row of Pascal's Triangle 1 12 66 220 495 792 \_\_\_\_\_ 792 495 220 66 12 1

a) 924 b) 792 c) 1584 d) 1200

7. In the House of Representatives of the 100<sup>th</sup> Congress there were 253 Democrats and 182 Republicans. If members had been randomly selected, what is the probability that a 13-member House committee would have only Democrats?

a) 
$$\frac{13}{253}$$
 b)  $\frac{253}{435}$  c)  $\frac{1}{\binom{435}{13}}$  d)  $\frac{\binom{253}{13}}{\binom{435}{13}}$ 

8. Davis High School has 100 seniors taking Russian, 200 seniors taking Spanish and 150 seniors taking French. Of these seniors, 25 take both Russian and Spanish, 40 take both Spanish and French, and 30 take both French and Russian. If 10 seniors take all 3 languages, and 135 take none, how many seniors are there in Davis High?

a) 400 b) 500 c) 600 d) 800

9. Assume that the probability of a boy being born is  $\frac{1}{2}$  and the probability of a girl being born is  $\frac{1}{2}$ . In a family of 3 children, what is the probability that the family will have at least one boy?

a) 
$$\frac{1}{2}$$
 b)  $\frac{1}{8}$  c)  $\frac{7}{8}$  d)  $\frac{1}{4}$ 

10. Determine the term in the expansion of  $(a - 2b^2)^7$  that involves  $a^4$ .

a)  $-280a^4b^6$  b)  $35a^4b^3$  c)  $24a^4b^7$  d)  $-35a^4b^6$ 

11. What is the rectangular form of the plane given by the following parametric x = 2 + 2s - 3t

equations? y = -1 + s + tz = 4 - s + 2t

a) x+y+z=5 b) 2x+2y+3z=12 c) 3x-y+5z=27 d) 5x-3y+2z=21

12. Find the length of the projection of  $\vec{v} = 2\vec{i} + 5\vec{j}$  onto  $\vec{u} = 4\vec{i} + 7\vec{j}$ .

a) 
$$\frac{7}{\sqrt{65}}$$
 b)  $\frac{43}{\sqrt{65}}$  c)  $-\frac{43}{\sqrt{65}}$  d)  $\sqrt{65}$ 

13. Which of the following is an equation in polar coordinates of y=2x?

a) 
$$r = 2\theta$$
 b)  $\theta = 2$  c)  $\tan \theta = 2$  d)  $\cot \theta = 2$ 

14. A vector equation of the line is  $\vec{r} = (3\vec{i} + 5\vec{j}) + t(6\vec{i} - 2\vec{j})$ . What is the y-intercept?

a) (0,6) b) (0,3) c) (0,-6) d)  $\left(0,-\frac{1}{2}\right)$ 

1) d 2) a 3) b 4) b 5) c 6) a 7) d 8) b 9) c 10) a 11) c 12) b 13) c 14) a