1. By drawing the triangle,
2. **E**. This is an arithmetic sequence. Ten minutes is 600 seconds. The 600th term of the sequence is . The sum of the first 600 terms is .
3. To find the arc length, 120 degrees is one-third of a full circle **B**
4. This is a Donkey Theorem question. The altitude to side AB would have to have a length of , which makes the smallest possible value of a=7. **C**
5. Airplane’s Vector: +Wind’s Vector: = **C**
6. (3 R’s)(3 vowels)=9 ways **A**
7. Both cans Veggie: (3/8)(2/7) + Both Cans Noodle: (5/8)(4/7) = 13/28 **D**
8. The 200 would be opposite the 60 degree angle in one of the six triangles formed in the hexagon. This makes the side of the hexagon , so to find the area you just use the formula: **B**
9. Since the vectors are in component form, they start from the origin (tail). So 30% of the way to the tip of the second vector is just <2.1, 3.5, 1.4> **D (Thrown Out at Convention)**
10. The Single Digit Quadruples are: (1,2,2,3), (2,3,6,7), (1,4,8,9), (4,4,7,9). **D**
11. **C**
12. **B**. This is a geometric sequence. The ratio is 2. After 12 hours, the number of bacteria is .
13. For this ellipse, the minor radius (b) would be 15, and the major radius (a) would be 25. Using the Pythagorean relation to solve for c, we find c=20. The eccentricity is c/a = 4/5 **B**
14. **C**. First, the mouse must go from (0,0) to (5,3). This requires 8 moves, 5 across and 3 up. The number of ways is . The number of ways to go from (5,3) to (6, 8) is one move across and 5 moves up. The number of ways is . 56(6) = 336.
15. **B**. There are two equations, one on number of animals and one on the number of legs. They are . Solving these equations leads to x = 56 and y = 225. The positive difference between the two animals is 225 – 56 = 169.
16. **A**
17. **D**
18. By physics and breaking up the vector into components,

**A**

1. The height is found from the y equation, and the max value is when cosine would be -1, so 34. **C**
2. By drawing a picture, we can see this is in the Third Quadrant with a reference angle of 60 degrees. **B**
3. **B**
4. **A**
5. **C**. There are three ways in order for heads to occur. This leads to a total probability of . Therefore, the probability of tails is . In order for the game to be fair, the amount won times the probability for each person must be equal. So, .
6. **C**

.12

.56

.19

.13

U

M

1. **D**
2. Arc Length: +2 radii (8), so **B**