Student Name: _____

Please write your name on *every* page.

5 Section E

E1
Alice is standing in a field. A volleyball is 30 m from her, and a football is 40 m from her. Bob draws a circle that passes through Alice and the two balls. If the two balls are directly across the circle from each other, what is the distance in meters between the two balls?

Answer to E1: _____

E2
How many three digit positive integers have a hundreds digit greater than the tens digit and a tens digit greater than the ones digit?

Answer to E2: _____

E3
A square wall is completely covered with 144 same size square tiles, using red and black tiles. The outermost border is red, the second border is black, the third border is red, and the colours continue alternating in this way. How many more red tiles than black tiles are there on the entire wall?

Answer to E3: _____

E4
Yitong rolls a fair 6-sided die 3 times. What is the probability that the total is exactly 13?

Answer to E4: _____

E5
An ant crawls on the surface of a box that measures 1 cm by 2 cm by 4 cm. It starts at one corner and wants to reach the corner farthest from it, staying on the surface. What is the shortest distance in cm it can crawl?

Answer to E5: _____

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E6

There is a rainbow gumball machine that dispenses different coloured gumballs. After dispensing, every gumball in the machine changes colour: red to green, green to blue, and blue to red. There are initially 7 gumballs in the machine: 2 red, 2 green, and 3 blue. What is the probability that all gumballs are blue when they are dispensed?

Answer to E6: _____

E7

A number is stony if its digits multiply to 24, and rocky if its digits add to 12. How many positive integers are both stony and rocky?

Answer to E7: _____

E8

A 6x6 grid has each cell coloured either red or white. If every row, column, and main diagonal must have exactly one red cell, how many colourings are possible?

Answer to E8: _____