Stage I Question Set 8

1) 20 questions
2) Completion time 30 to 40 minutes
3) Calculators are permitted
4) No penalty for incorrect answers
5) Diagrams are not drawn to scale

QUESTION #1
Barry is rolling dice. He rolls one die and gets a "6". What are the odds that his total score will be "7" when he rolls the other die?

a) 1/6 b) 2/6 c) 1/12 d) 5/24 e) none of the above

QUESTION #2
Evaluate (a - b) + (ab) if a = 5 and b = 1000.

a) 4095 b) 5095 c) 5995 d) 4005 e) none of the above

QUESTION #3
Henry found that he paid 30% of his $40,000 annual income on income taxes. How much less would Henry pay in taxes if he moved to a jurisdiction where the income tax rate on his income was 10%?

a) $7,500 b) $6,000 c) $12,000 d) $8,000 e) none of the above

QUESTION #4
What is the mean average value of the set {1,2,4,5,2,4} ?

a) 3.5 b) 2.8 c) 3 d) 4 e) none of the above

QUESTION #5
During a tedious class, Lynne is counting away the seconds until she can go home. She notes that it is exactly 2:37 p.m. If the teacher lets the class out at exactly 3:00 p.m., how many seconds does Lynne have to wait?

a) 23 b) 1380 c) 1980 d) 720 e) none of the above

QUESTION #6
A certain number of cubes with dimension 2 x 2 x 2 are glued together to make a large cube with dimension 32 x 32 x 32. How many small cubes does it take to make up the large one?

a) 32768 b) 16384 c) 4096 d) 8192 e) none of the above

QUESTION #7
Cynthia built a summer cabin which has an area of 10 m². Given that 12 inches = 1 foot, and 1m = 39.37 inches, what is the square footage of Cynthia's cabin, to the nearest whole number?

a) 90 b) 80 c) 105 d) 110 e) none of the above

QUESTION #8
A square with dimensions 30 cm x 30 cm is cut into a number of smaller squares. Which of the following are possible ways for the square to be cut, such that the entire square is accounted for?

a) 2 squares which are 15 cm x 15 cm
b) 4 squares which are 15 cm x 15 cm
c) 6 squares which are 5 cm x 5 cm
d) all of the above
e) none of the above

QUESTION #9

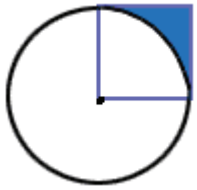
$$Evaluate\ \frac{m-n}{m^2}\quad where\ m=(n+1).\ Express\ the\ result\ in\ terms\ of\ n.$$

a) n/(n + 1)² b) 2n/(n + 1) c) 1/(n+1)² d) 1/n² e) none of the above

QUESTION #10
0 < mn < 1. If m = 25, which of the following are possible values for n?

a) n = -1 b) n = 1 c) n = 0 d) n = 1/25 e) none of the above

QUESTION #11
The circle has a diameter of 8 cm. The square is circumscribed as shown. What is the area of the shaded region?



a) 64 - 4π b) 4 + 4π c) 64 – 16π d) 16 – 4π e) none of the above

QUESTION #12

$$For\ what\ value\ of\ x\ is\ \frac{x-500}{300-x}\ a\ maximum,\ if\ x\ is\ an\ integer?$$

a) 301 b) 500 c) 300 d) –500 e) none of the above

QUESTION #13
-1 < x < 0. y = 1/2. What is the largest element in the following set ?

$$\left\{\frac{x}{y}, \frac{y}{x}, x-y, y-x, 0\right\}$$

a) x/y b) y/x c) x – y d) y – x e) 0

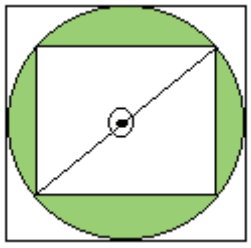
QUESTION #14
If the average high-school student spends about 1 hour per day studying 270 days per year, approximately how many hours will the student spend studying for all of Grades 9, 10, 11 and 12?

a) 1080 hours b) 810 hours c) 910 hours d) 1000 hours e) none of the above

QUESTION #15
A rectangular solid with dimensions of 1 cm x 2 cm x 3 cm was glued into the corner of a 4 cm x 4cm x 4 cm cube. Find the interior surface area in cm², not including the top of the cube, which is open.

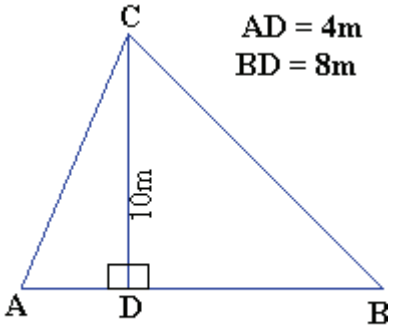
a) 58 b) 75 c) 69 d) 80 e) none of the above

QUESTION #16
The outside square has a side of 16 cm. A circle is inscribed inside the square, and another square is inscribed inside the circle, as shown. What is the area of the shaded region?



a) 256π – 128 b) 64π – 128 c) 64π 64 d) 128π – 64 e) none of the above

QUESTION #17
What fraction represents the proportion of the area of triangle ADC to the area of triangle BCD?



a) 1/3 b) ½ c) 1/6 d) ¼ e) none of the above

QUESTION #18
How many leap years have there been from 1901 to 1995?

a) 24 b) 25 c) 23 d) 30 e) none of the above

QUESTION #19
Valerie ordered two large pizzas for her drama group, each of which was cut into 12 equal pieces. Valerie ate 1/6 of one of the pizzas, and the other 9 members of the group consumed 2/3 of the total number of pieces. How many pieces were left over?

a) 8 b) 6 c) 9 d) 12 e) none of the above

QUESTION #20
How many numbers between 50 and 200 have digits which sum to 9?

a) 9 b) 15 c) 12 d) 14 e) none of the above