

Stage I Question Set 6

- 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:

Evaluate $x^2 + 2x + 3x^2 + 4x - 10x - 3x^2 + 5 + 4$.

- a) $4x^2 - 8x + 5$ b) $7x^2 + 19x + 9$ c) $x^2 - 4x + 9$ d) $-4x + 4$ e) none of the above

QUESTION #2:

$AC = AB/3$. If A is at 0, and B is at 36, where is C at?

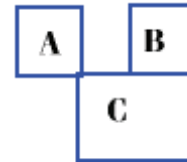
- a) 18 b) 24 c) 15 d) 12 e) none of the above



QUESTION #3:

A and B are identical squares. C is a rectangle with a height equal to the side of A, and a length equal to twice the side of A. What is the area of A + B + C in m^2 if the side of A equals 6m?

- a) 144 b) 108 c) 72 d) 36 e) none of the above



QUESTION #4:

Solve for x. $14 + x + 13x - 5 + 2 = 16 - 3x$.

- a) $x = 19/7$ b) $x = 9/17$ c) $x = 2$ d) $x = -13/23$ e) none of the above

QUESTION #5:

A regular hexagon with side s has the same perimeter as a square. What is the area of the square?

- a) $4s^2$ b) $3s^2$ c) $1.75s^2$ d) $2.25s^2$ e) none of the above

QUESTION #6:

How many prime numbers are between 100 and 120?

- a) 5 b) 7 c) 6 d) 4 e) none of the above

QUESTION #7:

How many numbers between 58 and 71 are divisible by 3?

- a) 6 b) 4 c) 5 d) 3 e) none of the above

QUESTION #8:

For what values of x is $2x < x$? x is a real number.

- a) $-\frac{1}{2} < x < \frac{1}{2}$ b) $x < 0$ c) $x = 0$ d) $x > \frac{1}{2}$ e) none of the above

QUESTION #9:

What is the average of $\{x, x - 1, x + 1, 5, 4\}$ when $x = 3$.

- a) 3.4 b) 4 c) 5 d) 4.6 e) none of the above

QUESTION #10

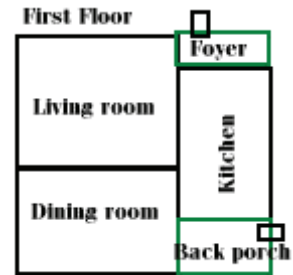
How many tiles must be used to exactly cover a convention floor with dimensions of 100m x 200m if the tiles have dimensions of 0.1m x 0.1m?

- a) 20,000 b) 2,000,000 c) 500,000 d) 40,000 e) none of the above

QUESTION #11

The figure is a floor plan of the first floor of a house. The entire first floor comprises a square of 10m x 10m. The foyer and the back porch take up 8m². The living room is 5m x 7m. How many square meters do the kitchen and dining room take up?

- a) 35 b) 43 c) 57 d) 73 e) none of the above



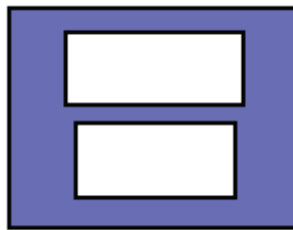
QUESTION #12

Find the missing number N in the sequence $\{1, 5, 10, 16, N, 31\}$

- a) 23 b) 19 c) -15 d) 14 e) none of the above

QUESTION #13:

The largest rectangle shown has dimensions of 6m x 9m. The next-largest rectangle (inside the largest rectangle) has an area which is $\frac{1}{3}$ of the largest rectangle. The smallest rectangle (inside the largest rectangle) has an area which is $\frac{1}{4}$ of the largest rectangle. What is the area of the shaded region in m²?



- a) 36 b) 31.5 c) 22.5 d) 40.5 e) none of the above

QUESTION #14:

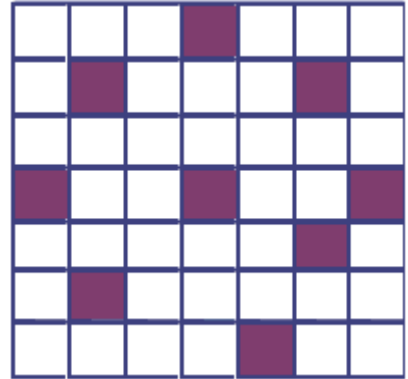
While taking a biking tour in Holland (which has flat land), Cyrus biked 4 km east, 15 km north, 3 km east, 17 km west, and 5 km south before breaking for lunch. How many km west was Cyrus of his original starting point?

- a) 12 km b) 8 km c) 54 km d) 7 km e) none of the above

QUESTION #15

The square is made up of 49 identical squares, with some of them shaded. How many more squares have to be shaded in order for the figure to have $\frac{3}{7}$ of its squares shaded?

- a) 21 b) 14 c) 16 d) 12 e) none of the above



QUESTION #16:

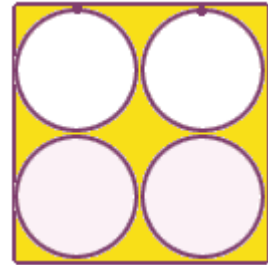
How many years from 1 A.D. to 1996 A.D. are divisible by 7?

- a) 285 b) 1995 c) 186 d) 205 e) none of the above

QUESTION #17

Four identical circles (each with radius R) are inscribed inside the square as shown. What is the area of the shaded region in terms of R ?

- a) $R^2(\pi - 1)$ b) $R^2(2 - \pi)$ c) $R^2(4 - \pi)$ d) $2R^2$ e) none of the above



QUESTION #18:

N is the smallest 4-digit number divisible by 3,4 and 5. Find N .

- a) 1200 b) 1440 c) 6000 d) 1020 e) none of the above

QUESTION #19:

A rectangular solid which is 4 cm x 4 cm x 8 cm has its surfaces which are 4 x 4 painted green, and its surfaces which are 4 x 8 painted blue. When the solid is cut into unit cubes, how many have green paint on them?

- a) 24 b) 64 c) 32 d) 36 e) none of the above

QUESTION #20:

Sarah wants to make her room have a chessboard style floor, with alternating black and white squares. Her room is 3m x 3m. The squares are 20 cm x 20 cm. Which of the following statements are true?

- a) Sarah will use exactly the same number of black squares as white squares.
b) Sarah will use a total of 225 squares.
c) There will be exactly 12 squares along the length of the room.
d) a & b
e) b & c