Qualification Round

Time : 60 mins   15 Questions   Max points: 15

1. When x = -2, the value of $(1 + x)^3$ is

    (A) -3   (B) -2 (C) -0 (D) -1 (E) 8

2. What is the smallest positive integer that is a multiple of each of 2, 3, 4, 5, 6, 7, 8?

    (A) 420 (B) 560   C) 840   D) 1120   E) 6720

3. Which list of numbers is written in increasing order?

    (A) 2017, $\sqrt{2017}$, 2017^2
    (B) 2017, 2017^2, $\sqrt{2017}$
    (C) $\sqrt{2017}$, 2017^2, 2017
    (D) 2017^2, $\sqrt{2017}$, 2017
    (E) $\sqrt{2017}$, 2017, 2017^2

4. The 17th day of a month is Saturday. The first day of that month was

    (A) Sunday (B) Monday (C) Tuesday (D) Wednesday (E) Thursday

5. Anna got 60% of the test 1. She received 90% on the national test. To calculate her final grade in percent her teacher added 30% of the test 1 to 70% of her national test result.
What was her final grade?

   (A) 81%   (B) 83%   (C) 84%   (D) 85%   (E) 87%

6. Christian scored a total of 60 points in 15 innebandy games. Anna played 5 fewer games than Christian. But Her scoring average was 0.5 points per game higher than Christian's scoring average. How many points, in total, did Anna score?

   (A) 35   (B) 40   (C) 45 (D) 50   (E) 55

7. 30 tickets are numbered from one to thirty. One ticket is drawn at random. What is the probability that the ticket shows a number that is a prime number?

   (A) 9/30   (B) 2/5   C) 13/30   (D) 7/15   (E) 1/3

8. Sam walks at a constant rate for 10 minutes and then rests for 10 minutes. Which of these distance, d, versus time, t, graphs best represents his movement during these 20 minutes?

(A) d

10   20

(B) d

10   20

(C) d

10   20
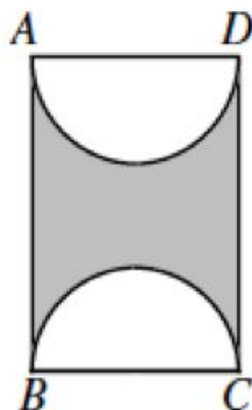
(D) d

10   20

(E) d

10   20
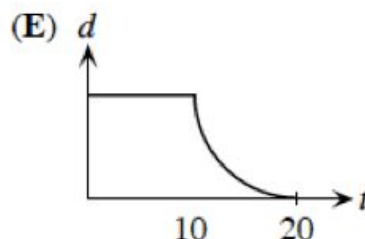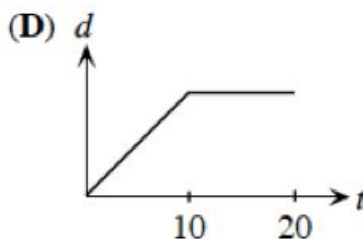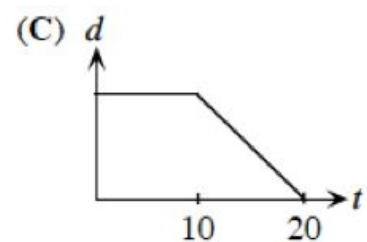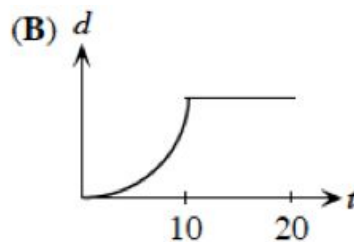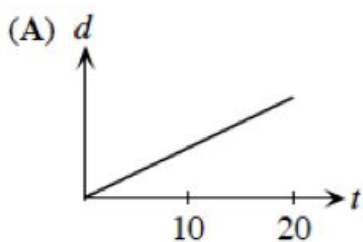
9. A rectangle is divided into four smaller rectangles. The areas of three of these rectangles are as shown in the diagram. (not to scale)
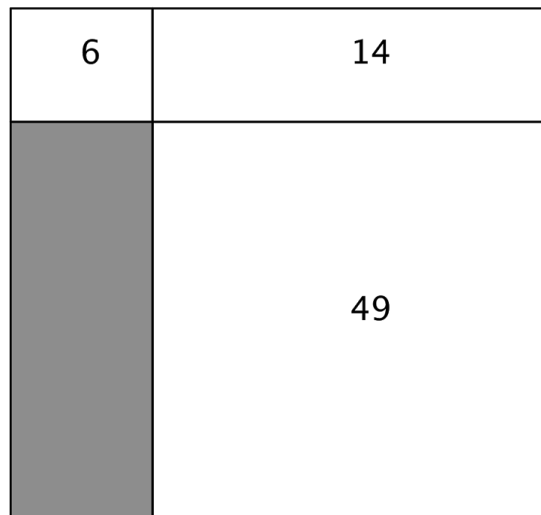
The area of the shaded rectangle is:

(A) 9   (B) 10   (C) 12   (D) 14   (E) 21

10. ABCD is a rectangle with AD = 10 . If the shaded area is 100, then the shortest distance between the semicircles is


(A) 2.5π (B) 5π (C) π (D) 2.5π + 5 (E) 2.5π – 2.5

11.　　You throw two six sided dices and calculate the product of their dots. What is the probability that the product is a cubic number (the product of a whole number multiplied by itself three times.)

(A) 1/36 (B) 2/36 (C) 3/36 (D) 4/36 (E) 5/36

12.　　In the diagram, points Q and R lie on line PS and angle W = 38. If angle TQP = angle TQW = x, and angle VRS = angle VRW = y, and U is the point of intersection of lines TQ and VR extended, then the acute angle at U is
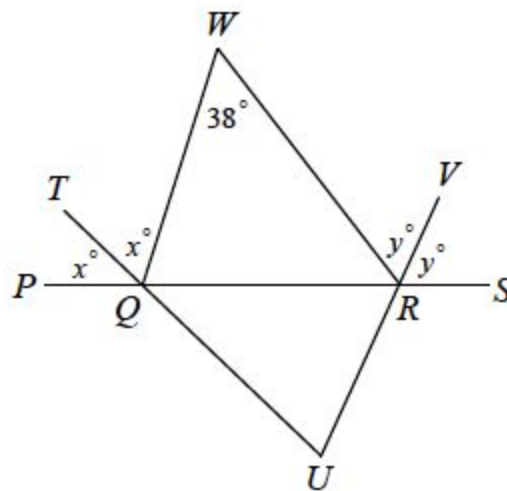

(A) 45° (B) 60° (C) 71° (D) 76° (E) 81°

13.　　There are a number of students in the math club Malmö Borgarskola. When Svetlana tries to group the students in groups of 4, there is one group of 3 students, but all of the other groups are complete. When she tries to put the students in groups of 3, there are 3 more complete groups than there were with groups of 4, and exactly one group with two members in it.

How many students are there in the math club?

(A) 31 (B) 32 (C) 33 (D) 34 (E) 35

14.   Two ladders are leaned against a wall such that they make the same angle
       with the ground. The 10 m ladder reaches 8 m up the wall. How much
       further up the wall does the 18 m ladder reach? (Diagram not to scale)
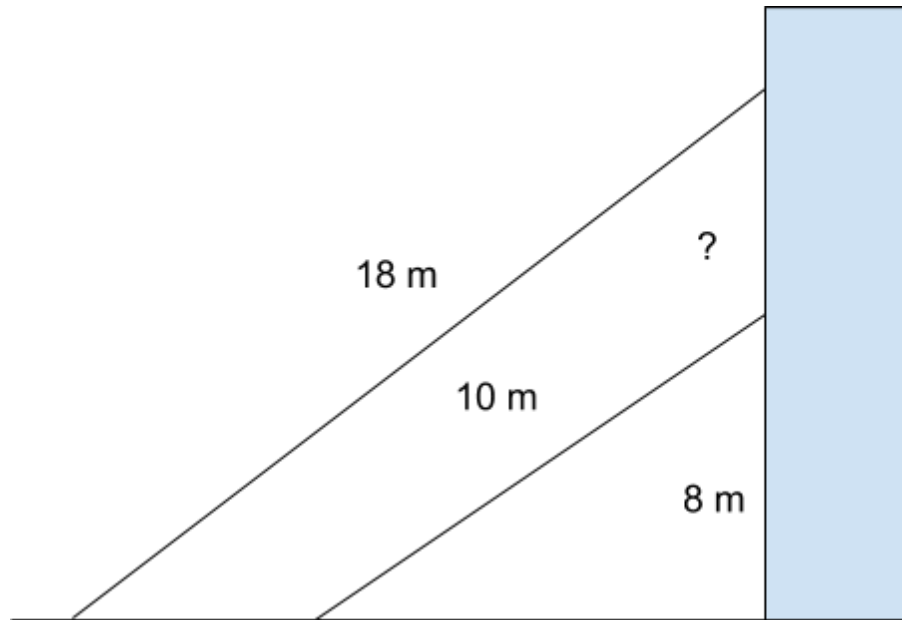
A) 2,25 m B) 6,0 m C) 6,4 m D) 8,2 m E) 10 m

15.   In a magic square, the numbers in each row, the numbers in each column,
       and the numbers on each diagonal have the same sum. In the magic square
       shown, the sum a + b + c equals

a	13	b
19	c	11
12	d	16

(A) 49 (B) 54 (C) 47 (D) 50 (E) 46