Preca College Korçë

Mathematics Entrance Exam

29th June 2017

Time: 8:00 - 10:00

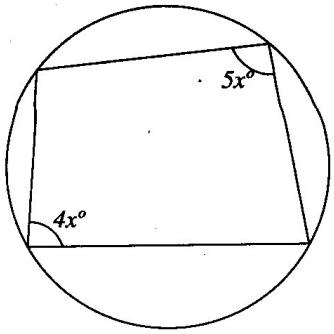
Name: _____ ***Index number:*** _____

INSTRUCTIONS TO CANDIDATES

* **Answer all questions.**
* **Do all your working in the space provided besides each question.**
* **Write down the answer to each question in the space provided (Ans._____)**

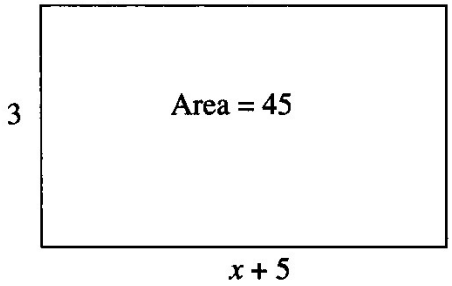
QUESTIONS 1 TO 8 CARRY 1 MARK EACH. IN QUESTIONS 1 – 4, FIND THE VALUE OF x.

Q. 1



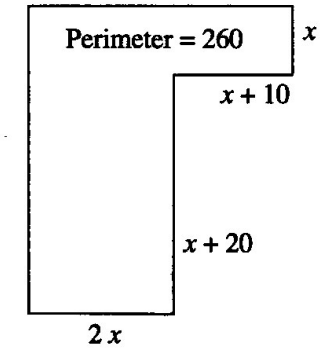
Ans. x = _____

Q. 2



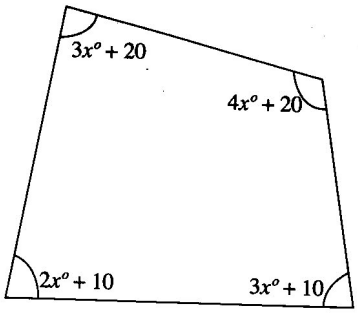
Ans. x = _____

Q. 3



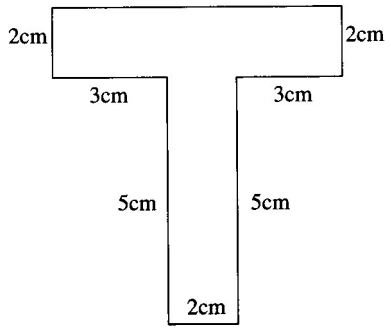
Ans. x = _____

Q. 4



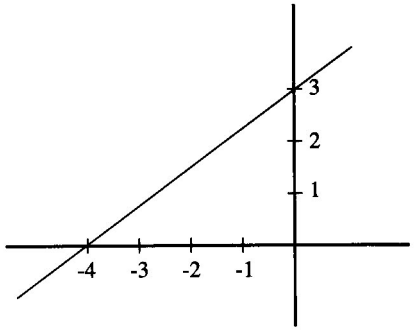
Ans. x = _____

Q. 5 Find the area of the diagram.



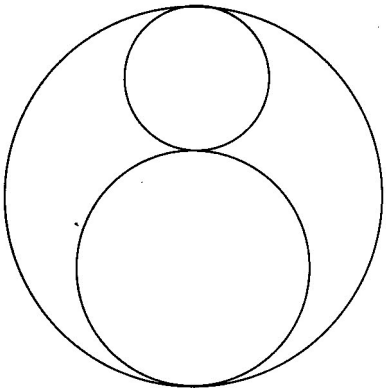
Ans. Area = _____

Q. 6 Find the gradient of the given line.



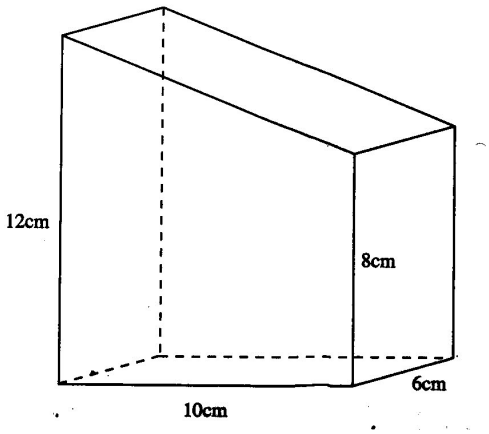
Ans. Gradient = _____

Q. 7 If the inside circles have radii of 5cm and 7 cm, find the radius of the large circle.



Ans. Radius = _____

Q. 8 Find the volume of the given PRISM.



Ans. Volume = _____

Q. 9 Change the subject of the formula as required. (5 marks)

a) Make ***h*** the subject of the formula: $A = \frac{1}{2}h\left(a + b\right)$. Ans._____

b) Make ***d*** the subject of the formula: $H = \frac{2}{5}nd^2$ Ans. _____

c) Make ***r*** the subject of the formula: $V = \frac{4}{3}\pi r^3$ Ans. _____

d) Make ***h*** the subject of the formula: $A = 2\pi r(r+h)$ Ans. _____

Q. 10 a) Factorize: (6 Marks)

(i) $3a^2 + 5a + 2$ (ii) $12x^2 - 11x - 5$

b) Factorize completely

(iii) $5x^2 - 45y^2$ (iv) $3a^2 - 9ab - 30b^2$

Q. 11 Simplify the following expressions: (4 marks)

(i) $3a[2(a - 1) - (a + 2)]$ (ii) $5x - 3[2(x + 1) - 3(x - 2)]$

(iii) $\frac{(ab - b^2)}{(a-b)^2}$ (iv) $\frac{(p^2 + p)}{(p+1)^2}$

Q. 12 Solve these equations: (9 marks)

(i)

$$64x^2 - 25 = 0$$

Ans. x = _____

(ii)

$$x - \frac{16}{x} = 0$$

Ans. x = _____

(iii)

$$10x^2 = 15 - 19x$$

Ans. x = _____

(iv)

$$12x^2 = 25x - 12$$

Ans. x = _____

Q. 13 Solve the systems of equations (10 marks)

(i) 7a – 2b = 27

3a + 5b = 35

Ans. _____

(ii) $x + y = 10$

$x^2 - y^2 = 40$

Ans. _____

(iii) $\frac{2}{3}a - \frac{1}{2}b = 2$ $\frac{3}{4}a - \frac{1}{3}b = \frac{19}{6}$

Ans. _____

Q. 14 A rectangular field is surrounded by a wall. The surface area of the field is $1200m^2$.
The width of the field is ¾ the length of the field. Using this information: (8 marks)

a) Sketch the field and label its corners ABCD.

b) Find the length and width of the field.

Ans. _____

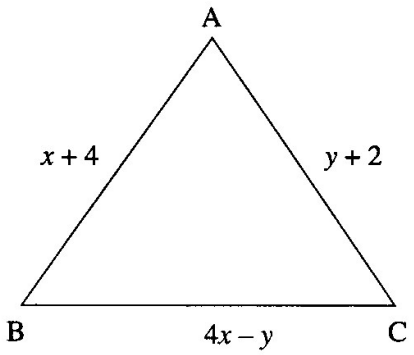
c) How long is the surrounding wall?

Ans. _____

d) What is the length of one of its diagonals?

Ans. _____

Q. 15 ABC is an equilateral triangle whose sides are in centimeters. (5 marks)



(i). Find the values of x and y.

Ans. _____

(ii). Find the perimeter of the triangle.

Ans. _____

Q. 16.a) There are 35 workers in a factory. The skilled workers are each paid €24 a day and the unskilled workers are each paid €16 a day. Each day, together, they earn €792. Calculate the number of skilled and unskilled workers in the factory. (12 marks)

Ans. _____

b) Maria's and Francesca's ages add up to 25 years. Eight years ago Maria was twice as old as Francesca. How old are they now?

Ans. _____

Q. 17.a) If f(x) = 3x +1, calculate: (7 marks)

(i) f(1) (ii) f(2) (iii) f(3)

b.) For the function $f(x) = 5^x$, evaluate:

(i) f(2) (ii) f(3) (iii) f(-3)

c.) If $f(x) = 5x + 3$, write down the following in their simplest form.

(i) $f(x + 1)$

(ii) $f(x + 2)$

(iii) $f(x – 3)$

Q. 18 The given table shows the results of a survey on how many birds and cats a class of children had at home.
(6 marks)

		B	**I**	**R**	**D**	**S**
		0	**1**	**2**	**3**	**4**
C	**0**	0	3	4	3	2
A	**1**	3	2	1	1	2
T	**2**	2	1	0	2	1
S	**3**	0	1	1	1	0

From this survey find:

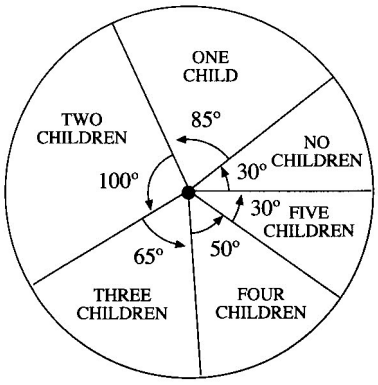
a.) how many children were there in this class Ans. _____

b.) how many children owned 4 pets Ans. _____

c.) how many children owned at least 3 pets Ans. _____

d.) how many children owned at least 6 pets Ans. _____

Q. 19 The given figure represents a survey carried out among a group of families living in one particular street. Given that 6 families had no children, (7 marks)



a.) How many families had 1 child? Ans. _____

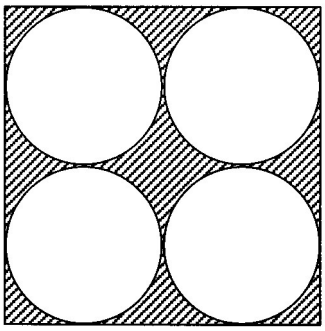
b.) How many families were surveyed? Ans. _____

c.) How many families had 2 or 3 children? Ans. _____

d.) How many children lived in the street? Ans. _____

e.) What was the average number of children per family? Ans. _____

Q. 20 Four cylindrical containers are placed in a box as shown in the given diagram.
The radius of each cylinder is 5 cm. The height of each cylinder is 20 cm, and the height of the box is also 20 cm. Find: (5 marks)



a) The volume of the box. Ans. _____

b) The volume of the four cylinders. Ans._____

c) The volume of the empty space inside the box. Ans. _____

The cylindrical containers are filled with a liquid of density 1 gram/centimeter^3 .

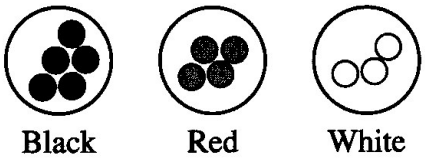
i.) What should be the weight of the box when the cylindrical containers are completely full.
(Ignore the weight of the box and the four containers).

Ans. _____

ii.) If one such box weighed 5kg, how much liquid was missing?

Ans. _____

Q. 21 There are 12 coloured balls in a bag as shown below: (8 marks)



a.) Three balls are picked at random one after the other.
After each picking, the ball picked is returned to the bag again.
What is the probability that the 3 balls picked will all be RED?

Ans. _____

b.) If 3 balls are picked at random, what is the probability that all 3 balls will be WHITE?

Ans. _____

c.) If 3 balls are picked at random, what is the probability that 2 balls will be RED and 1 will be BLACK?

Ans. _____

d.) If 3 balls are picked at random, what is the probability that 1 ball will be WHITE, 1 ball will be RED and 1 ball will be BLACK?

Ans. _____

GOOD LUCK TO ALL