



Preca College
Mathematics Entrance Exam
1st July 2009
Time: 8:00a.m. - 10:00a.m.

DO NOT
WRITE IN
THIS MARGIN

Name: _____

Index number: _____

Answer all questions. 5 marks each. Total 100 marks.

1. Evaluate, giving your answer in standard form:

a) $(16.8 \times 10^4) \div (4.2 \times 10^{-3})$

.....
Answer: _____

b) If $z = 2 \times 10^3$ and $y = 3.98 \times 10^{-6}$, find the value of zy

.....
Answer: _____

c) If $M = 3 \sqrt{(a \div b)}$, find M when $a = 6.7 \times 10^{-4}$ and $b = 4.3 \times 10^{-5}$

.....
Answer: _____

2. a) If $\frac{1}{R} = \frac{1}{a} + \frac{1}{b}$ find an expression for R in the form $R =$

.....
Answer: _____

b) If $pr - p = qr + q$, find an expression for r in the form $r =$

.....
Answer: _____

c) If $v^2 = u^2 + 2as$, find an expression for u in the form $u =$

.....
Answer: _____

3. A cuboid has a volume of 146 cm^3 . Two sides measure 6 cm and 8 cm. Find the length of the third side in cm.

.....
Answer: _____

4. (i) Find the value of y in the following:

a. $(x^2)^y = x^9$

.....
Answer: _____

b. $(x^3)^y = \frac{1}{x}$

.....
Answer: _____

- (ii) Solve the following equation for x :

$$\frac{3^x}{3^{4x}} = \frac{1}{27}$$

.....
Answer: _____

5. A cylinder has a diameter of 3 cm and a height of 4 cm. Find:

- a) The surface area of cylinder

.....
Answer: _____

- b) Volume of cylinder

.....
Answer: _____

6. I have 34 bags. Some of these bags weigh 4 kg and the rest weigh 3 kg each. The total weight of all the bags is 125 kg.

a. If the number of 3 kg bags is n , what is the number of 4kg bags in terms of n ?

.....
Answer: _____

b. Find the number of 3 kg bags and 4 kg bags.

.....
Answer: _____

7. There are six white balls and two red balls in a box. I take out two balls, without looking at the colours.

a. What is the probability that the first ball is red?

.....
Answer: _____

b. If the first ball taken is red, what is the probability that the second ball taken out will be also red?

.....
Answer: _____

c. Draw a probability tree to represent taking out two balls in sequence.

.....
.....
Answer: _____

d. What is the probability that two white balls are taken out?

.....
Answer: _____

e. What is the probability that one white and one red balls are taken out?

.....
Answer: _____

f. What is the probability that two yellow balls are taken out?

.....
Answer: _____

8. On the graph paper provided, draw the graph of $y = x^2 - x - 5$ for values of x in the range of -3 to 4. Then use your graph to solve the equation: $x^2 - x - 5 = -3$

.....
Answer: _____

9. a) A curtain of length 2.8 m shrinks by 2.5% when it is washed. How much shorter is the curtain after washing?

.....
Answer: _____

- b) I have \$1,000 in a bank account, giving an interest rate of 3% per year. The interest earned is added to the sum of money in the same account. What is the amount of money in my account after two years?

.....
Answer: _____

10. a) A square ABCD has an area of $x \text{ cm}^2$. What is the area of a square having its sides measuring twice as long as that of ABCD?

.....
Answer: _____

- b) Two cubes have sides of lengths x and $2x$ respectively. If the smaller cube has a volume of 3 cm^3 , what is the volume of the larger cube?

.....
Answer: _____

11. a) Two whole numbers multiply to give -20 and add to give 1. What are the numbers?

.....
Answer: _____

- b) Two whole numbers multiply to give -12. What is the largest number they can add up to?

.....
Answer: _____

12. Write down the next three terms in the following sequences:

a) 3, 7, 11, 15, _____, _____, _____.

b) 13, 9, 5, 1, _____, _____, _____.

c) 3, 12, 48, _____, _____, _____.

d) 1, 1, 2, 3, 5, 8, 13, 21, _____, _____, _____.

13. a) A car travels 45 km at 60 km/hour. How long will it take?

.....
Answer: _____

b) A plane travels 1800 km in 2 hours and 30 minutes. What is its average speed?

.....
Answer: _____

c.) A train travels for 285 minutes at an average speed of 45 km/hour. How far will it travel?

.....
Answer: _____

14. Quadrilateral PQRS has angle P=110°, angle Q=95° and angle S= 70°.

a) Find angle R

.....
Answer: _____

b) Show that PQ and RS are parallel

.....
Answer: _____

c) What kind of quadrilateral is PQRS?

.....
Answer: _____

15. A rectangle has sides measuring $2b$ and $3b$. The length of the perimeter is 24 cm.

a) Find b

.....
Answer: _____

b) Find the area of the rectangle.

.....
Answer: _____

16. Paul counts the number of letters in the names of everyone in his class.
The frequency table on the right shows the results.

Number of letters	Frequency	Number of letters multiplied by Frequency
3	4	
4	3	
5	3	
6	3	
7	2	
8	4	
9	1	
Totals		

a. Complete the table

b. Find the mean of letters per name

.....
Answer: _____

c. Find the median number of letter per name

.....
Answer: _____

17. In a park, a tree grows on a horizontal ground. From a point 15 metres from the base of the tree, the angle of elevation of the top of the tree is 42° .

Calculate the height of the tree, correct to three significant figures.

.....
Answer: _____

18. Phil buys 4 chocolate bars and 1 packet of mint. It costs him 134 leke.

John buys 3 chocolate bars and 3 packets of mint. It costs him 150 leke.

Find how much one chocolate bar costs and how much one packet of mint costs.

.....
Answer: _____

19. Seven of the interior angles of a nonagon (nine-sided polygon) are: 105° , 115° , 125° , 135° , 140° , 145° , 155° . The remaining two angles are equal. Find the size of each.

.....
Answer: _____

20. Find the factors of this equation and then solve for x:

$$2x^2 + 3x - 2 = 0$$

.....
Answer: _____
