

FEDERAL REPUBLIC OF SOMALIA

GRADE 12 EXAMS, 2017

MATH



OFFICE OF EXAMINATIONS AND CERTIFICATION



Name.....

School .....

Roll Number.....

**Somali Federal Ministry of Education, Culture & Higher Education**

**Form Four National Standardized Examinations.**

**MAY / JUNE 2017**

**MATHEMATICS EXAMINATION**

**TIME 2 HOURS**

**INSTRUCTIONS:**

- This paper consists of 12 printed pages
- There are 2 sections.
  - ⇒ **PART 1:** 20 Multiple Choice Questions (40 marks)
  - ⇒ **PART 2:** 12 Structured Questions (60 marks)
- TOTAL (100 marks)**
- Answer all questions in the spaces provided
- No extra paper is allowed



**PART 1: 20 MULTIPLE CHOICE QUESTIONS. Answer all questions. Circle the correct answer only (40marks)**

1. Which of the following is equal to  $\sin(A+B)$

- a)  $\cos A \cos B - \sin A \sin B$
- b)  $\cos A \cos B + \sin A \sin B$
- c)  $\sin A \cos B + \cos A \sin B$
- d)  $\sin A \cos B - \cos A \sin B$

2. Which of the following is equal to  $\sin 300^\circ$

- a)  $\sin 60^\circ$
- b)  $-\sin 60^\circ$
- c)  $\cos 60^\circ$
- d)  $-\cos 60^\circ$

3. The probability of getting sum of 12 in throwing two dice is:

- a)  $\frac{1}{36}$
- b)  $\frac{2}{9}$
- c)  $\frac{1}{18}$
- d)  $\frac{5}{36}$

4. A bag contains 6 black and 8 white balls. One ball is drawn at random. What is the probability that the ball drawn is white?

- a)  $\frac{3}{4}$
- b)  $\frac{3}{7}$
- c)  $\frac{1}{8}$
- d)  $\frac{4}{7}$

5. If  $\sin \theta = \frac{5}{13}$  then  $\cos \theta$  is equal to

- a)  $\frac{12}{13}$
- b)  $\frac{12}{5}$
- c)  $\frac{13}{12}$
- d)  $\frac{5}{12}$

6. The median of this data 2, 3, 1, 6, 4, 5, 7 is

- a) 3                      b) 5                      4                      d) 6

7. The solution of  $\int(3x^2 + 2) dx$  is

- a)  $3x^2 + 2 + c$       b)  $6x + 2x + c$       c)  $x^3 + 2x + c$       d)  $2x^2 + 3x + c$

8. A pair of dice is rolled. What is the probability of obtaining the sum of the values being 7?

- a)  $\frac{1}{2}$   
b)  $\frac{3}{5}$   
c)  $\frac{1}{6}$   
d)  $\frac{5}{36}$



9. Three coins are tossed. Find the probability of getting three heads.

- a)  $\frac{1}{8}$                       b)  $\frac{3}{8}$                       c)  $\frac{2}{8}$                       d)  $\frac{5}{8}$

10. The minimum point of the function  $y = x^2 - 3x + 2$  is:

- a) (3, 2)  
b)  $(\frac{3}{2}, -\frac{1}{4})$   
c) (1, 0)  
d) (2, 0).

11. The median of this set 23, 20, 21, 22, 28, 27, 25, 29, 26 is

- a) 24                      b) 21                      c) 23                      d) 25

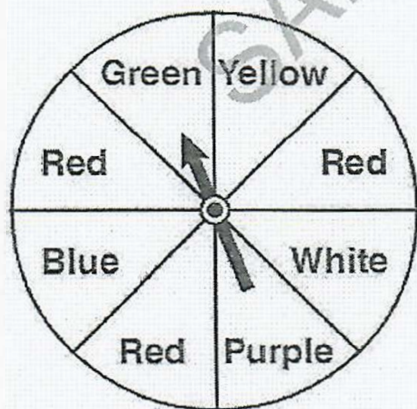
12. The gradient of  $y = x^3 - x$  at P(1, 1) equals:

- a). 1                      b). 2                      c). 3                      d). 4

13. Shamso paid \$ 900 for a computer after getting a discount of 20%. What was the marked price for the computer?

- a) \$ 720  
 b) \$ 1080  
 c) \$ 920  
 d) \$ 1125

14. The spinner below is divided into eight equal regions and is spun once. What is the probability of NOT getting a red?



- a)  $\frac{3}{5}$                       b).  $\frac{3}{8}$   
 c).  $\frac{5}{8}$                       d).  $\frac{7}{8}$

15. If  $f(x) = \frac{2x-3}{5}$ , then  $f(4)$  is equal to:

- a) 1                      b).  $\frac{2}{5}$                       c). 0                      d). -3

16. Simplify  $(3i - 5) + (i + 8)$

- a).  $2i + 13$                       b).  $3i^2 - 3$                       c).  $4i + 3$                       d).  $3i + 3$

17. If  $y = 3x^2 + 3x - 6$ , then  $\frac{dy}{dx} =$

- a).  $6x - 6$                       b).  $6x + 3$                       c).  $x^3 + 3x$                       d).  $6x + 3x - 6$

18. Evaluate  $\lim_{x \rightarrow 5} (x^2 - 5x + 20)$

- a) 20                      b) 70                      c) 10                      d) 0

19.  ${}^5C_2$  is equal to:

- a). 7                      b). 10                      c). 20                      d). 12

20.  $7! \div 5!$  is :

- a) 7!                      b) 2!                      c) 42                      d) 24

**Part 2: Answer ALL Questions (60 marks)**

1. Evaluate  ${}^{10}P_4$

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 .....  
 .....  
 .....  
 ..... (3 marks)

2. Use the numbers in the list below to answer all the following questions.

36, 29, 41, 45, 15, 10, 13

a) (i) Calculate the mean of the seven numbers.

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 .....  
 .....  
 ..... [2]

(ii) Find the median.

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 .....  
 ..... [2]

(iii) Find the range..... [1]

b) A number from the list is chosen at random.

Find the probability that the number is

(i) even,..... [1]

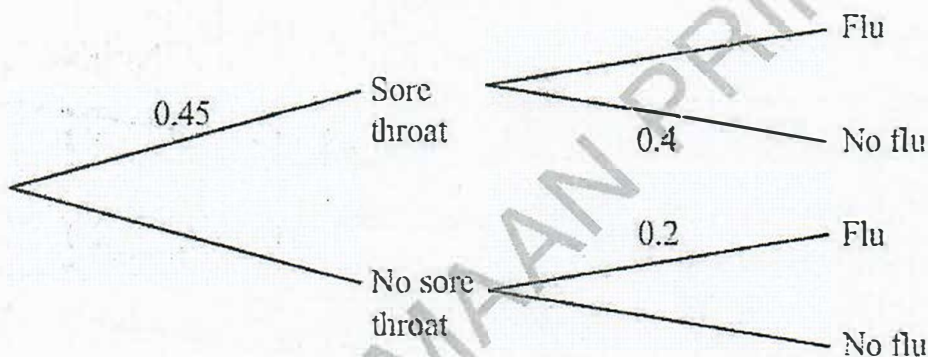
(ii) a multiple of 5..... [1]



3. Evaluate  $\lim_{x \rightarrow 3} \frac{x^2 - 9}{(x - 3)}$

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 .....  
 .....  
 .....  
 ..... (3 Marks)

4. In a flu epidemic 45% of people have a sore throat.  
 If a person has a sore throat the probability of not having flu is 0.4.  
 If a person does not have a sore throat the probability of having flu is 0.2.



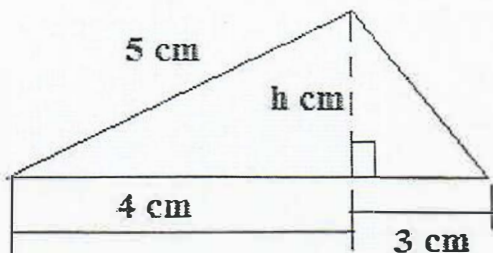
Calculate the probability that a person chosen at random has flu.

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 ..... (6 Marks)

5. Evaluate  $\int_{-3}^3 (x^2 + 5) dx$

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 .....  
 .....  
 .....  
 ..... (5 Marks)

6. For the triangle shown below



a) calculate the height ( h cm) of the triangle ( 2 Marks)

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b) Find the area of the triangle (2 marks)

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7a) Simplify  $\frac{\sqrt{2}}{3+\sqrt{2}}$  by rationalizing the denominator. ( 3 Marks)

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b). Solve for  $x$  if  $\log_{10}(x + 2) + \log_{10} 3 = \log_{10} 12$  ( 3 Marks)

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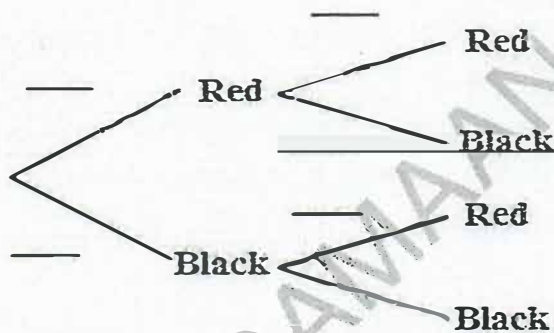
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8. Mohamed has 12 pens. 5 of the pens are red. 7 of the pens are black.  
He keeps all the pens in a box. Mohamed removes one pen at random. He records its colour and replaces it in the box. Mohamed removes a second pen at random, and again records its colour.

c) Complete the tree diagram.



b) Calculate the probability that the two pens removed:

(i) will both be red.....[3 Marks]

(ii) will be different colours.....[3 Marks]



11. For the grouped data

Number of seats	Frequency	Mid pint x	fx
8-10	4		
11-13	7		
14-16	11		
17-19	15		
20-22	8		
	$\Sigma f =$		$\Sigma fx =$

- a) Complete the table to show the mid-points (2 marks)
- b) Which is the modal class ..... (1mark)
- c) Calculate the mean (3 marks)

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12. Solve the following simultaneous equations: (3 Marks)

$$4x + 3y = 9$$

$$2x + 5y = 15$$

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**END**