FKS F2 2024-2025 First Term UT ans

S2 First Term Uniform Test (2024-2025)

Mathematics

(1 hour)

Date: 1st November 2024

Time: 8:30 a.m. – 9:30 a.m.

Name:_____

Class: _____ No.: _____

Instructions to students:

1. This paper consists of THREE parts, Conventional Questions, Multiple-choice Questions and Bonus Question. There are Section A and Section B in Conventional Questions. Section A carries 43 marks, Section B carries 13 marks, Multiple-choice Questions carry 12 marks and Bonus Question carries 3 marks.

2. The maximum score of this paper is 68.

3. Attempt ALL questions in Conventional Questions and Multiple-choice Questions. Write your answers in the spaces provided in this Question / Answer Book.

4. Unless otherwise specified, show your workings clearly.

5. The diagrams in this paper are not necessarily drawn to scale.

Conventional Questions

Section A (43 marks)

1. Simplify the following ratios.
   (a) 0.8 kg : 2.4 kg
   (b) 300 mL : 1.2 L
   (c) $\frac{2}{5} : \frac{16}{25} : \frac{14}{15}$

(5 marks)

2. Expand the following expressions using identities.
   (a) $(13 - x)(13 + x)$
   (b) $(7 - 6x)(-7 - 6x)$
   (c) $[-4(5x + y)]^2$

(6 marks)

3. Car A travels 98 km in 2 hours and car B travels 576 m in 40 seconds.
   (a) Which car, A or B, has a faster average speed?
   (b) Spencer has to get to a place which is 12 km away in 15 minutes. He claims that he can reach the destination in time by taking car A. Do you agree? Explain your answer.

(5 marks)

4. The scale of the guide map of a theme park is 1 : 400. If the actual diameter of a merry-go-round is 10 m, find the diameter of the merry-go-round on the map in cm.

(3 marks)

5. If $(x-3)(Ax+4) \equiv 5x^2 + Bx + C$, where A, B and C are constants, find A, B and C.

(5 marks)

6. In Figure 1, C is a point lying on BD.

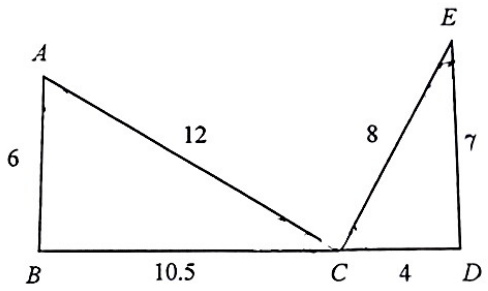

Figure 1

(a) Prove that $\Delta ABC \sim \Delta CDE$.

(b) If $\angle BAC = 61°$ and $\angle CED = 30°$, find $\angle ACE$.

(5 marks)

7. Determine whether $(3x - 7)(2x + 5) = 6x^2 + x - 35$ is an identity.

(4 marks)

8. It is given that $\triangle IJK \sim \triangle DFE$. $IJ = 18$, $DF = 12$ and $DE = 16$.
   (a) Find IK.
   (b) If $JK = 30$, find FE.

(5 marks)

9. Candy is now 15 years older than Michael. 10 years later, the ratio of Michael's age to Candy's age will be 4 : 7.

   (a) Find the ratio of Michael's present age to Candy's present age.

   (b) When will the ratio of Michael's age to Candy's age be 4 : 9? Explain your answer.

(5 marks)

Section B (13 marks)

10. (a) Expand $(5x - 3y)^2$ using identities.

(b) Hence, expand $(10a - 3b + 6)^2$.

(5 marks)

11. In Figure 2, WZY is a straight line.

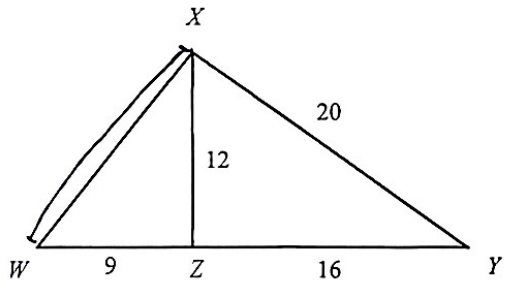

Figure 2

(a) Find WX.

(b) Determine whether $\triangle WXY$ and $\triangle WZX$ are similar.

(8 marks)

Multiple-choice Questions (12 marks)

Each question carries 2 marks. Put ✓ in the correct boxes.

	12	13	14	15	16	17
A						
B						
C						
D						

12. Which of the following is an identity / are identities?

I. $4(a+2)-8=4a$

II. $(4a-1)(a+2)+2-7a=4a^2$

III. $(4a+1)^2-1-8a=(4a)^2$

A. I and II only

B. II and III only

C. I and III only

D. I, II and III

13. Eddie, Frankie and Gary share some toy cars in the ratio 4 : 7 : 5. If Eddie gets 80 toy cars, What is the total number of toy cars?

A. 140

B. 256

C. 320

D. 400

14. It is given that y is inversely proportional to x. When $x=9$, $y=16$. When $x=6$, $y=$

A. 24.

B. 12.

C. 6.

D. 4.

15. In Figure 3, which of the following must be correct?

I. $\triangle ABD \sim \triangle DBC$

II. $\angle ABD = \angle DBC$

III. $BC = 4$

A. I and II only

B. I and III only

C. II and III only

D. I, II and III

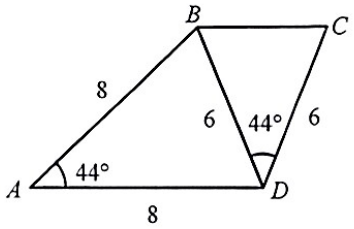

Figure 3

16. $\left(5x^2 - \frac{y}{2}\right)^2 =$

A. $25x^4 - 5x^2y + \frac{y^2}{4}$

B. $25x^4 - 5x^2y + \frac{y^2}{2}$

C. $5x^4 - \frac{5x^2y}{2} + \frac{y^2}{4}$

D. $5x^4 - \frac{5x^2y}{2} + \frac{y^2}{2}$

17. In Figure 4, BEC and DGC are straight lines. If $ABCD \sim ECGF$, find x.

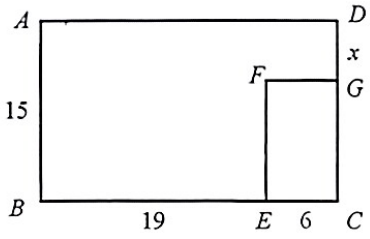

Figure 4

A. 3

B. 5

C. 10

D. 11.4

Bonus Question (3 marks)

18. If $u^{50} + v^{50} = 10$ and $(uv)^{25} = 3$, find the value of $u^{100} + u^{50}v^{50} + v^{100}$.

END OF PAPER