HY F2 Mid Term Assessments (SAMPLE PAPER 2)

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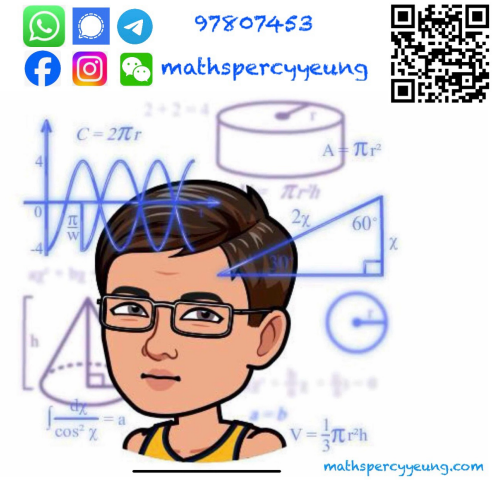
Form 2 Mathematics

Question Paper



Time allowed: 1 hour

Total: 50 marks

Instructions

1. Write down your name, class and class number in the designated spaces on the Question Paper and both Question-Answer Booklets.

2. The paper consists of FOUR sections, A, B, C and D.

3. Attempt ALL questions in Sections A, B and C. The question in Section D is **OPTIONAL**. Do all your work in the Question-Answer Booklets. **No work in the Question Paper** will be marked.

4. For Sections B, C and D, write your answers in the spaces provided in the Question-Answer Booklets. Do not write in the margins. Answers written in the margins will not be marked. Unless otherwise specified, all working must be clearly shown.

5. Unless otherwise specified, numerical answers should be either exact or correct to 3 significant figures.

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

Section A: Multiple Choice Questions (10 marks)

1. If y is 20% greater than x, then $x: y =$

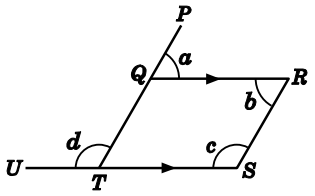
   A. $4 : 5$.
   B. $5 : 4$.
   C. $6 : 5$.
   D. $5 : 6$.

2. If $(4x + 4y) : (x^2 - y^2) = 4 : 1$ and $x: y = 2 : 1$, then $y =$

   A. 1 .
   B. 2 .
   C. 3 .
   D. 4 .

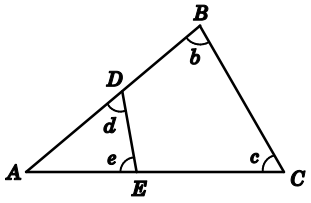
3. In the figure, *PQT* and *UTS* are straight lines. Which of the following must be true?

   A. $a = b$
   B. $b = c$
   C. $a + d = 180°$
   D. $b + d = 180°$



4. In the figure, *ADB* and *AEC* are straight lines. If $b = e$, which of the following must be true?

   A. $b = c$
   B. $c = d$
   C. $DE \parallel BC$
   D. $b + c + d + e = 360°$



5. Refer to the figure. Which of the following must be true?

I. $\triangle ABP \cong \triangle ACP$

II. $\triangle ABP \cong \triangle BCP$

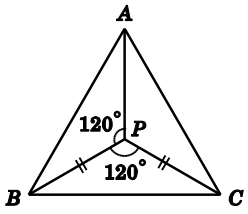
III. $\triangle BCP \cong \triangle ACP$

A. I only

B. II only

C. III only

D. I, II and III



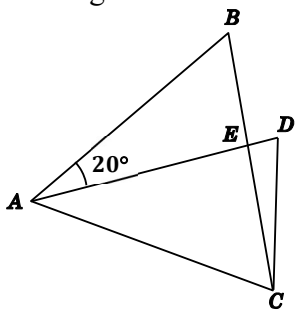
6. In the figure, AD and BC intersect at E. If $\triangle ABC$ is an equilateral triangle and $AC = AD$, find $\angle ADC$.

A. 70°

B. 72°

C. 79°

D. 82°



7. In the figure, ADC is a straight line. $BD \perp AC$ and $AB \perp BC$. Which of the following must be correct?

I. $\angle ABD = \angle ACB$

II. $\triangle ABC \sim \triangle ADB$

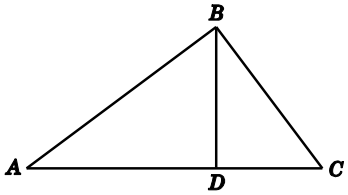
III. $AB^2 = AC \times AD$

A. I and II only

B. I and III only

C. II and III only

D. I, II and III



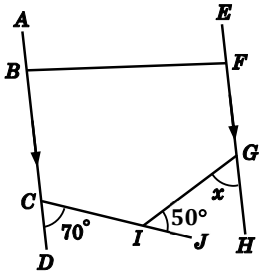
8. In the figure, $ABCD$, $EFGH$ and CIJ are straight lines and AD // EH. Find x.

A. 40°

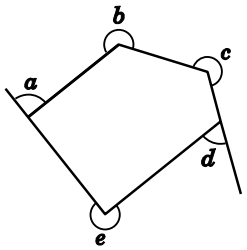
B. 50°

C. 60°

D. 80°



9. Refer to the figure. Find $a + b + c + d + e$.



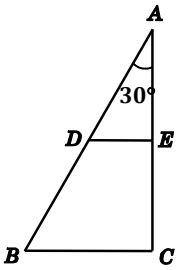
A. 360°

B. 540°

C. 720°

D. 900°

10. In the figure, ADB and AEC are straight lines. Which of the following conditions should be added to prove $DE \parallel BC$?



A. $\angle ADE = 60°$

B. $\angle ACB = 90°$

C. $\angle ADE + \angle ACB = 150°$

D. $\angle EDB = 2\angle DBC$

--- End of Section A ---

--- Please refer to the Question-Answer Booklets for Sections B, C and D. ---

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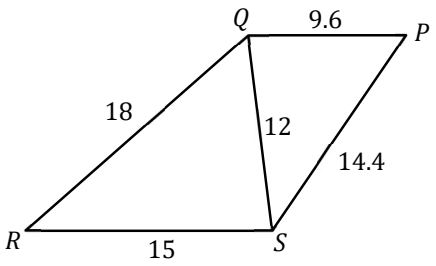
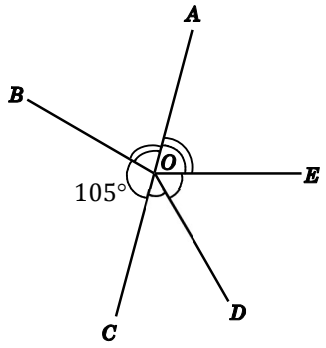
Section B: Short Questions (15 marks)

1. Refer to the figure. Prove that QP // RS. (4 marks)



2. In the figure ∠AOB = ∠AOE. ∠COD : ∠DOE : ∠AOE = 3 : 4 : 5. Prove that *AOC* is a straight line. (4 marks)



3. If the sum of interior angles of a polygon is three times the sum of its exterior angles, find the number of sides of the polygon. (4 marks)

4. Paul runs from point X to point Y at an average speed of 6 m/s for 24 seconds and then he runs from point Y to point Z at an average speed of 7.5 m/s. It is given that he runs at an average speed of 6.6 m/s for the whole journey. How long does he take to run from point Y to point Z? (3 marks)

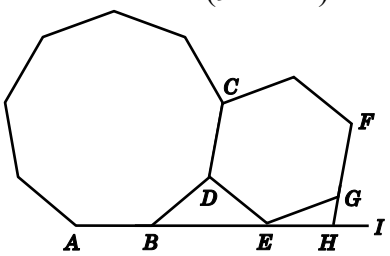
--- End of Section B ---

Name: _____Class: F. 2 _____ Class No.: _____

Section C: Long Questions (25 marks)

1. A bottle of solution consists of ingredients A, B and C. The ratio of the volumes of A, B and C in the solution is 2 : 3 : 5. The costs of A, B and C are \$0.4/mL, \$0.2/mL and \$0.1/mL respectively. (8 marks)
   a. If the volume of solution in the bottle is 200 mL, find the cost of the bottle of the solution.
   b. After some solution is used, the cost of B in the remaining solution is \$9.6. Find the volumes of A and C in the remaining solution.

2. In the figure, CD is a common side of a regular nonagon and a regular hexagon. FGH and ABEHI are straight lines. (9 marks)

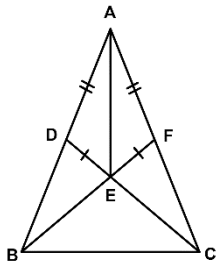


a. Find $\angle$BDE.

b. Find $\angle$DEB.

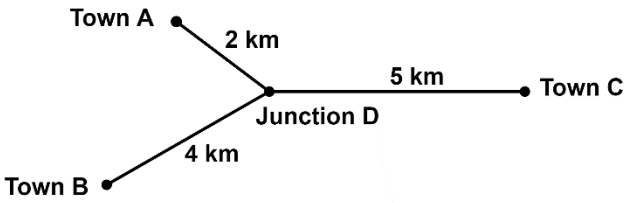
c. Find $\angle$GHI.

3. In the figure, *BEF* and *DEC* are straight lines. $AD = AF$ and $DE = EF$. (8 marks)
   a. Prove that $\angle DAE = \angle FAE$.
   b. Prove that $\angle AEB = \angle AEC$.
   c. A student claims that ΔBEC is isosceles. Is the claim correct? Explain your answer.



Section D: Challenging Question (Optional) (5 marks)

1. Peter and John live in Town A and Town B respectively. Both of them are going to visit Town C. Peter leaves home at 10:00am while John leaves home at 9:30am. They meet at junction D at 11:00am. After meeting at D, they walk to Town C together at the speed of the slower person. Find the ratio of Peter's average speed from Town A to Town C to John's average speed from Town B to Town C.



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