# HY F1 2024-2025 Final exam

## Question Paper

**F. 1 ABCDE** **June 2025**

**Time allowed: 2 hours**

**Total: 100 marks**

**Name:** _____ ( ) **Class: F.1**_____

**Instructions:**

1. Do not turn over the paper until you are told to do so.

2. Attempt ALL questions in this paper (except Section D, which is optional). All answers should be written on the respective answer sheets.

3. This paper consists of 4 sections, Sections A, B, C and D.

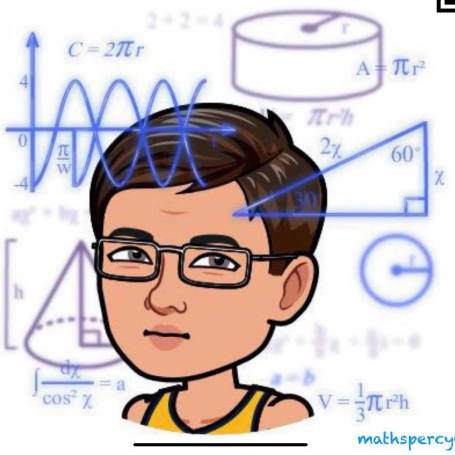
4. Write down your name, class and class number on the first page of all Question-Answer Booklets.

5. Section A is a multiple-choice section. Note that you may only choose one answer to each question in this section. If you choose more than one answer, you will receive no marks for that question. All questions in this section carry equal marks and no marks will be deducted for wrong answers. You must use a pencil to mark all the answers on the MC Answer Sheet for Section A. Otherwise, no marks will be awarded.

6. In Sections B, C and D, all workings must be clearly shown.

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





**Section A : Multiple Choice Questions (30 marks)**

1. $4\bigstar11$ is a 4-digit number. If it is divisible by 9, which of the following is the value of $\bigstar$?

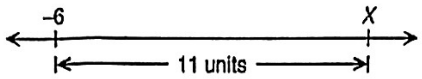
A. 2

B. 3

C. 4

D. 5

2. Referring to the following number line, find the number represented by $X$.




A. +5

B. −5

C. +6

D. −6

3. Which of the following expressions has a negative value?

A. $\dfrac{(+100)(-101)}{(-10)(+11)}$

B. $(-101)\div\dfrac{(-100)}{(-10)(-11)}$

C. $\dfrac{(-10)(-11)}{(-101)}\times(-100)$

D. $(-10)(-11)(-100)(+101)$

4. The L.C.M. of $3^3\times7^4\times11^2$ and $7^3\times11^3$ is

A. $7^3\times11^2$.

B. $7^4\times11^3$.

C. $3^3\times7^4\times11^3$.

D. $3^3\times7^7\times11^5$.

5. The result of subtracting $4x$ from 5 and then adding $6x$ to the difference is

A. $5-2x$.

B. $5+2x$.

C. $5-10x$.

D. $10x-5$.

6. Arrange the following set of numbers in ascending order.

$$\frac{26}{3},\ -\frac{7}{2},\ -\frac{11}{5},\ +5.2$$

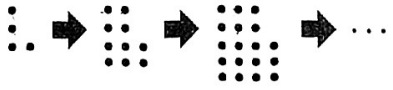
A. $-\frac{7}{2}<-\frac{11}{5}<\frac{26}{3}<+5.2$

B. $-\frac{11}{5}<-\frac{7}{2}<+5.2<\frac{26}{3}$

C. $-\frac{7}{2}<-\frac{11}{5}<+5.2<\frac{26}{3}$

D. $-\frac{7}{2}<+5.2<-\frac{11}{5}<\frac{26}{3}$

7. In the figure, the 1st pattern consists of 4 dots. For any positive integer $n$, the $(n+1)$th pattern is formed by adding $(2n+4)$ dots to the $n$th pattern. Find the number of dots in the 7th pattern.



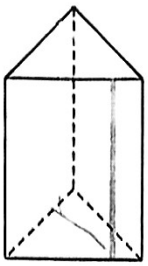
A. 54

B. 70

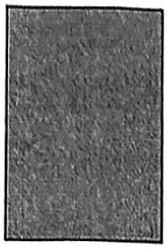
C. 72

D. 88

8. A triangular prism is placed horizontally as shown. It is cut vertically along the grey line. Which of the following figures may be the cross section obtained?



A.



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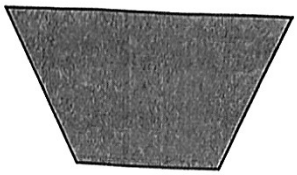

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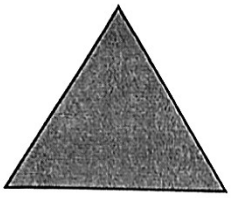
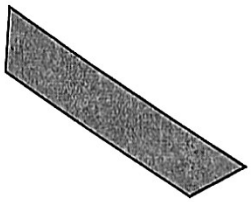


D.



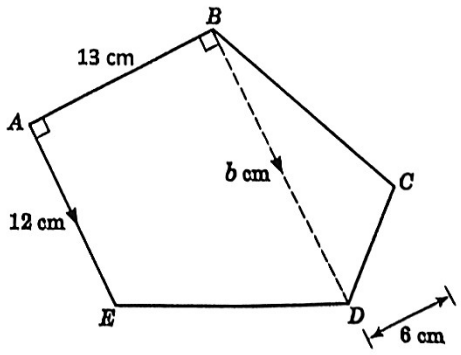
9. In the figure, the area of the pentagon is 220.5 $cm^2$. Find the value of $b$.

A. 15

B. 19

C. 26

D. 156



10. Fig. A shows a chocolate bar in the shape of a right triangular prism. Kay melts it to make a rectangular chocolate bar as shown in Fig. B. Find the total surface area of the chocolate bar in Fig. B.

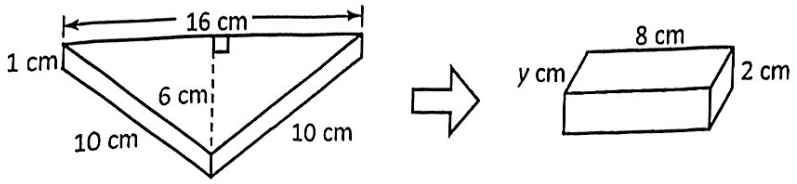



Fig. A Fig. B

A. 44 $cm^2$

B. 68 $cm^2$

C. 92 $cm^2$

D. 132 $cm^2$

11. $S(7, -6)$ and $T$ are two points on a vertical line in a rectangular coordinate plane. If $ST = 9$ units and the $y$-coordinate of $T$ is greater than 0, find the coordinates of $T$.

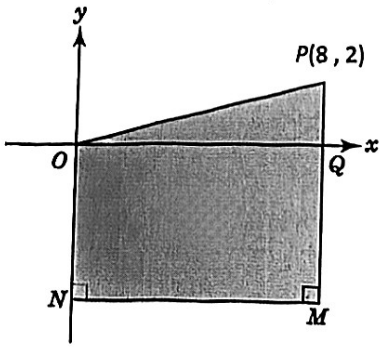
A. $(-2, -6)$

B. $(7, 2)$

C. $(7, 3)$

D. $(7, -15)$

12. The figure shows a trapezium $MNOP$ whose area is 48 sq. units. Find the length of $PM$.




A. 4 units

B. 5 units

C. 6 units

D. 7 units

13. In a rectangular coordinate plane, a point $P(r\ ,\ -s)$ is reflected in the $y$-axis to $Q(3\ ,\ 2)$. Find the values of $r$ and $s$.

A. $r = -3, s = -2$

B. $r = -3, s = 2$

C. $r = 3, s = -2$

D. $r = 3, s = 2$

14. In a rectangular coordinate plane, $P(8\ ,\ 3)$ is rotated about the origin $O$ through 180° to a point $Q$, then $Q$ is translated $k$ units to the right to a point $R$ such that $R$ is vertically below $P$. Find the value of $k$.

A. 5

B. 6

C. 11

D. 16

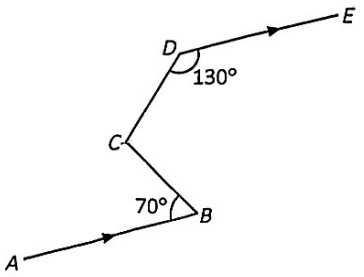
15. Refer to the figure. Find reflex $\angle BCD$.

A. 120°

B. 160°

C. 200°

D. 240°



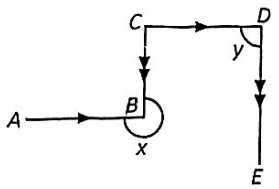

16. Refer to the figure. Which of the following must be true?

A. $x = 3y$

B. $x = y + 180°$

C. $x = y + 270°$

D. $x + y = 360°$



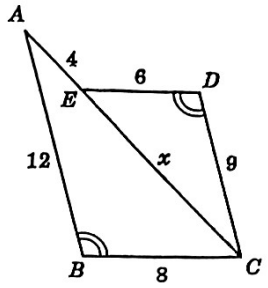
17. In the figure, $E$ is a point on $AC$. Find $x$.

A. 6

B. 8

C. 12

D. 16




18. The lengths of the sides of a triangle are 21.76 cm, 28.09 cm and 32.54 cm. By rounding up the length of each side to the nearest cm, estimate the perimeter of the triangle.

A. 70 cm

B. 83 cm

C. 84 cm

D. 100 cm

19. The following stem-and-leaf diagram shows the weights of the parcels received by a post office yesterday.

Weights of the parcels received by a post office yesterday

| *Stem (1 kg)* | *Leaf (0.1 kg)* |
|---|---|
| 0 | 3 4 6 7 9 9 |
| 1 | 0 *x* 8 *x* |
| 2 | 0 6 |

How many parcels weighed 1.8 kg or less?

A. 5

B. 8

C. 9

D. 10

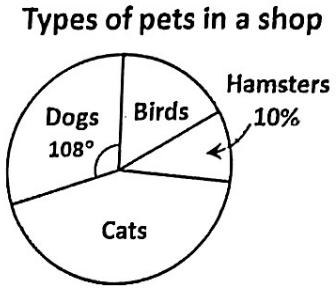
20. The pie chart below shows the types of pets in a shop. If there are 36 dogs in the shop, find the total number of birds and cats in the shop.

A. 48

B. 72

C. 120

D. 242




**END OF SECTION A**

**Section B : Short Questions (30 marks)**

1. Solve the equation $\frac{7(2-y)}{8} - \frac{y}{6} = 2(1-2y) - 1$. (5 marks)

2. Consider the sequence –8, –16, –24, –32, …. It is given that the general term of the sequence is $-8n$.

(a) Find the 20th term of the sequence.

(b) Which term of the sequence is –256? Explain your answer. (5 marks)

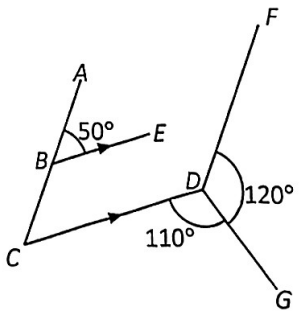
3. The height of Peter is 30% more than that of Joyce. It is given that Peter is 182 cm tall.

(a) Find the height of Joyce.

(b) The height of Annie is 30% less than that of Peter. Do Annie and Joyce have the same height? Explain your answer. (5 marks)

4. In the figure, $ABC$ is a straight line. Determine whether $AC$ is parallel to $FD$.

If yes, give reasons. (5 marks)

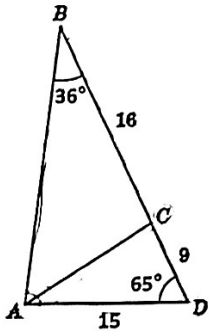


5. In the figure, $BCD$ is a straight line.

(a)(i) Find $\frac{CD}{AD}$ and $\frac{AD}{BD}$.

(ii) Write down a pair of similar triangles and give reasons.

(b) Find $\angle DAC$. (5 marks)



6. The weights of five tourists are given in the table below.

| | Paul | Queenie | Rose | Stanley | Tom |
|---|---|---|---|---|---|
| **Weight** | 82 kg | 53 kg | 76 kg | 104 kg | 99 kg |

(a) Estimate their total weight

(i) by rounding down each weight to the nearest 10 kg,

(ii) by rounding up each weight to the nearest 10 kg.

(b) The maximum weight that a hot-air balloon can carry is 450 kg. Can the balloon carry these 5 tourists at the same time? Explain your answer. (5 marks)

**END OF SECTION B**

**Section C: Conventional Questions (40 marks)**

1.

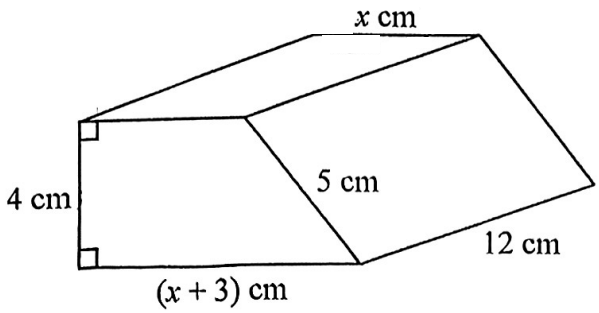



Figure A

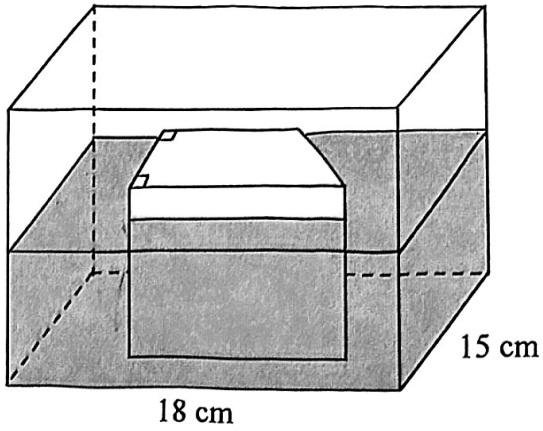



Figure B

(a) Figure A shows a right prism with a base in the shape of a trapezium. It is given that the total surface area of the prism is 348 $cm^2$. Find $x$.

(b) A rectangular tank with a length of 18 cm and a width of 15 cm contains some water to a depth of 8 cm. The right prism described in (a) is put into the rectangular tank and it is partially immersed in water (see Figure B).

(i) Find the new depth of water in the tank.

(ii) Find the percentage change in the dry surface area of the prism, correct your answer to the nearest per cent.

(10 marks)

2. The coordinates of the points $A$, $B$ and $C$ are (-1, 2), (-3, -4) and (5, -4) respectively. $D$ is a point on the same rectangular coordinate plane such that $ABCD$ is a parallelogram.

(a) (i) Find the coordinates of $D$.

(ii) Find the area of the parallelogram $ABCD$.

(b) $A$ is rotated anticlockwise about the origin through 90° to $P$. $B$ is reflected in the $y$-axis to $Q$. The coordinates of a point $R$ are (7, -4).

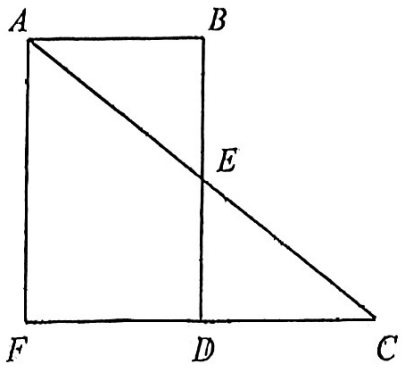
(i) Write down the coordinates of $P$ and $Q$.

(ii) $R$ undergoes a translation to $C$. Describe a possible translation from $R$ to $C$.

(iii) $S$ is a point such that $RS$ is a vertical line. If the area of the quadrilateral $PQRS$ is 42 square units, find the possible coordinates of $S$.

(10 marks)

3. In the figure, the straight lines $AC$ and $BD$ intersect at $E$. It is given that $AE = CE$ and $BE = DE$.




(a) Prove that $\triangle ABE \cong \triangle CDE$.

(b) $CD$ is produced to a point $F$ such that $AB = FD$.

(i) Prove that $\triangle ACF \sim \triangle ECD$.

(ii) Is $AF \parallel ED$? Explain your answer.

(iii) If $\angle EDC = 90°$, find $\dfrac{\text{Area of } \Delta ACF}{\text{Area of } \Delta ECD}$.

(10 marks)

4. (a) Company $X$ operates on producing and selling white T-shirts. The average cost \$$C$ of producing $n$ identical white T-shirts is given by the formula $C = 5 + \frac{5\,000}{n}$.

(i) Find the total cost of producing 1 000 white T-shirts.

(ii) Company $X$ sold 1 000 white T-shirts to Company $Y$ at a profit of 140%. If Company $X$ offered a 4% discount to Company $Y$, find the total marked price of the 1 000 white T-shirts.

(b) Company $Y$ then used the purchased white T-shirts to print 400 T-shirts with pattern $A$ and the rest with pattern $B$ for sale. A T-shirt with pattern $A$ and a T-shirt with pattern $B$ are sold at \$60 each and \$80 each respectively. Gift packs containing 1 T-shirt with pattern $A$ and 1 T-shirt with pattern $B$ are also prepared and sold at \$120 each.

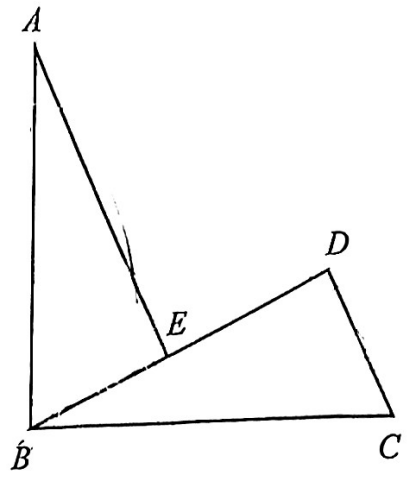
(i) The manager of Company $Y$ expected that the income is \$66 000 after selling all T-shirts and all gift packs. Find the expected number of gift packs sold.

(ii) It is given that the printing cost of each T-shirt is \$6 and the packing cost of each gift bag is \$5. If only gift packs could be sold, find the greatest possible percentage profit of Company $Y$.

(10 marks)

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

In the figure, $BED$ is a straight line. It is given that $AB = BC$, $AB \perp BC$, $AE \perp BD$ and $AE \parallel DC$. Prove that $AE = CD + DE$.



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