Form Three Mathematics Test (2023–2024)
Ch.5 Quadrilaterals

Class: F . 3 (   )   Name: _____ (   )

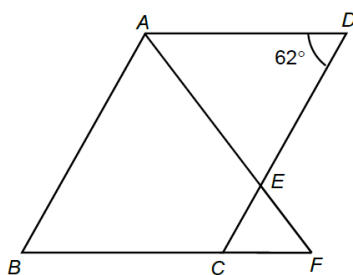|			
Mark		**/44**	**Class Average**
Parent's Signature:			

Time Allowed: 35 minutes
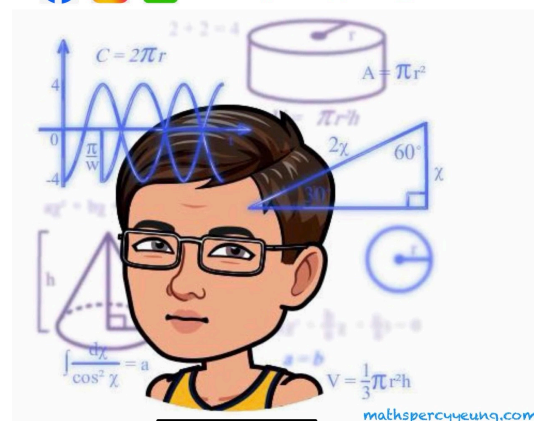
Date: 27/11/2023

Unless specified, the figures are not necessary drawn to scale.
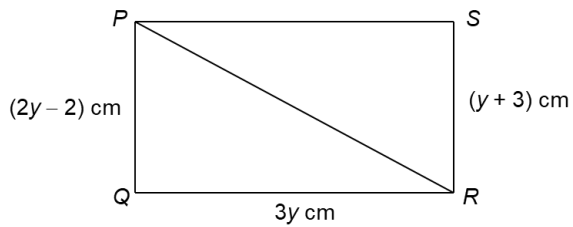**Section A: Multiple Choice (12 marks)**

1. In the figure, *ABCD* is a parallelogram. *BC* is produced to a point *F* such that *AF* intersects *CD* at *E* and *AF = BF*. Find $\angle AFB$.
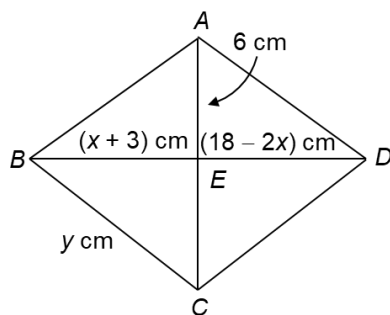

   A. 62°
   B. 59°
   C. 56°
   D. 53°

1

2. In the figure, *PQRS* is a rectangle. Find the length of *PR*.

P

S

(2*y* − 2) cm

(*y* + 3) cm

Q

R

3*y* cm

A. 5 cm

B. 8 cm

C. 15 cm

D. 17 cm

3. In the figure, *ABCD* is a rhombus. The diagonals *AC* and *BD* intersect at *E* such that *AE*=6 cm. Find the value of *y*.
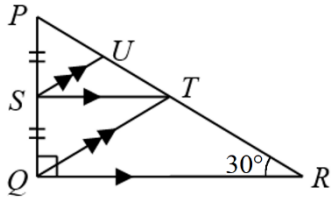

A

6 cm

(*x* + 3) cm (18 − 2*x*) cm

B

D

E

y cm

C

A. 8

B. 10

C. 12

D. 16

4. In the figure, *ABCD* is a square. *BC* is produced to *E* such that *CE* = 16 cm. *AE* and *CD* intersect at *F*. If *EF* = 20 cm, find the length of *AF*.
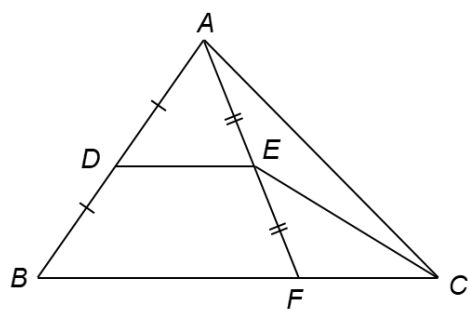

- **A.** 48 cm
- **B.** 60 cm
- **C.** 64 cm
- **D.** 80 cm

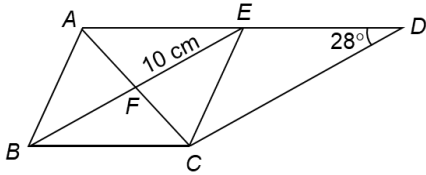**5.** In the figure, $PR = 4$ cm, $PR = 2PQ$, $\angle PRQ = 30°$. Which of the following is not true?
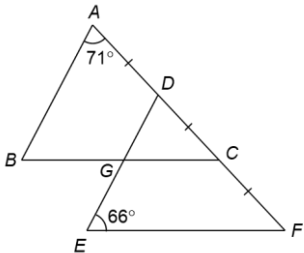

A. $\angle QPR = 60°$
B. $\triangle PQT$ is an equilateral triangle
C. $SU = 1$ cm
D. $ST = 2$ cm

6. In the figure, D and E are the mid-points of AB and AF respectively. BFC is a straight line. If the ratio of the area of $\triangle ABF$ to the area of $\triangle AFC$ is 5 : 2, find $FC : DE$.
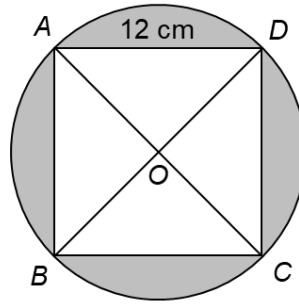

A. $4 : 5$

B. $5 : 4$

C. $5 : 14$

D. $14 : 5$

Section B: Short Questions (10 marks, 2 marks for each answer)

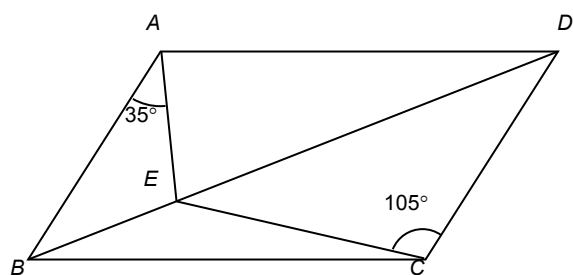|	Question	Answer
7.	In the figure, *ABCE* and *BCDE* are parallelograms. *AED*, *AFC* and *BFE* are straight lines. If $\angle ABC = 70°$, $\angle ADC = 28°$ and *EF* = 10 cm, find $\angle ABE$ and the length of *CD*.	
8.	In the figure, *C* and *D* are points on *AF* such that *AD* = *DC* = *CF*. *G* is the mid-point of both *BC* and *DE*. It is given that $\angle BAF = 71°$ and $\angle DEF = 66°$. Find $\angle DCG$.	

6

9. The circle in the figure passes through the vertices of square *ABCD*. The side length of the square is 12 cm. *AC* and *BD* are diameters of the circle, and they intersect at *O*. Find *AO* and the area of the shaded region, correct to 3 significant figures.
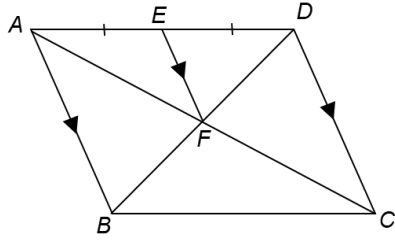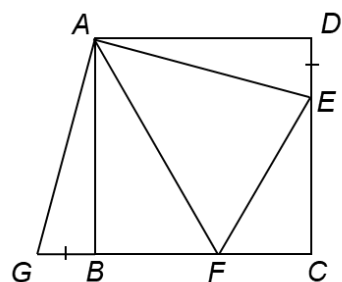
Section C: Long Questions (22 marks)

10.   In the figure, *BED* is a diagonal of parallelogram *ABCD*. If $\angle BAE = 35°$, $\angle DCE = 105°$ and
        AE = BE, find $\angle BEC$.   (4 marks)

12. In the figure, *AC* and *BD* intersect at *F*. *E* is the mid-point of *AD* and *AB* // *EF* // *DC*. Prove that *ABCD* is a parallelogram. (3 marks)
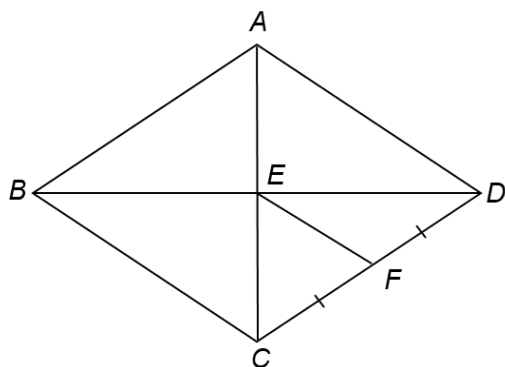
13. In the figure, $ABCD$ is a square. CB is produced to G such that $\angle BAG = 15°$. E is a point on CD such that $BG = DE$. It is given that F is a point on BC such that $\angle BAF = 30°$.

(a) Prove that
   (i) $\triangle ABG \cong \triangle ADE$,
   (ii) $\triangle AEF \cong \triangle AGF$.
(b) Find $\angle AFE$.

(6 marks)

14. In the figure, *ABCD* is a rhombus. *AC* and *BD* intersect at *E*, and *F* is the mid-point of *CD*.
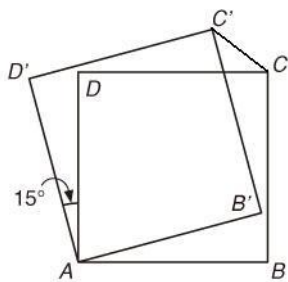

(a) Prove that $\triangle DEF$ is an isosceles triangle.

(b) Hence, if $\angle CFE = 66°$, find $\angle CBD$.

(5 marks)

Section D: Bonus (2 marks) Only answers are required.

15. In the figure, a square $ABCD$ is rotated through 15° anti-clockwise about A to $AB'C'D'$. Find $\angle CC'B'$.

- END OF PAPER