



دائرة التعليم والمعرفة
DEPARTMENT OF EDUCATION
AND KNOWLEDGE

S.B.M SCHOOL

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Final Revision

Mathematics

Grade: 9

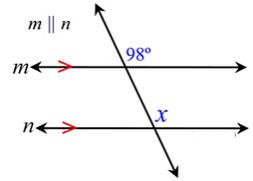
2017 – 2018

Third Semester

Question: 1

Choose one answer and circle it:

1]] (a) Find the measure of the angle marked with the x .



- (A) 82° (B) 88° (C) 92° (D) 98°

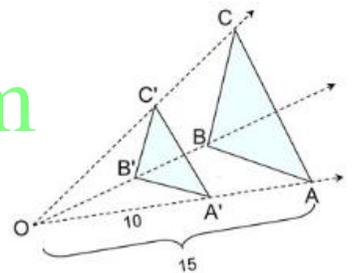
(b) What name is given to this pair of angles?

- (A) Alternate interior angles. (C) Alternate exterior angles.
 (B) Corresponding angles. (D) Interior \angle s on same side of transversal.

2]] A dilation centered at O is shown at the right. The image of $\triangle ABC$ is $\triangle A'B'C'$, $OA' = 10$

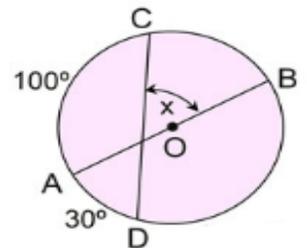
and $OA = 15$. What is the scale factor of the dilation?

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- (A) 2 (B) $\frac{3}{2}$ (C) $\frac{2}{3}$ (D) $\frac{1}{2}$

3]] Given circle O with diameter \overline{AB} . Find x .

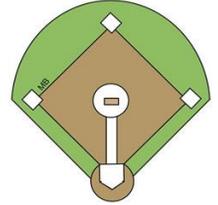


- (A) 25° (B) 40° (C) 45° (D) 55°

4]] If $\triangle ABC \cong \triangle DEF$ which choice is not necessarily true?

- (A) $\overline{EF} \cong \overline{BC}$ (C) $\overline{DF} \cong \overline{AC}$
 (B) $\angle ACB \cong \angle DEF$ (D) $\angle CAB \cong \angle FDE$

- 5]] The Andersons have a play house in their backyard. For the holidays, they want to place lights diagonally on the front of the roof (as shown). The roof is an isosceles trapezoid with a vertical height of 6 feet. $AB = 10$ feet and $DC = 6$ feet.



(a) How many feet of lights will be needed to cover the diagonals?

- (A) 18 (B) 20 (C) 24 (D) 42

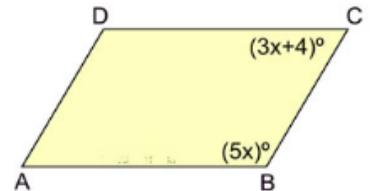
(b) A segment is drawn connecting first base to third base.

What is the measure of the angle formed between this segment and the segment connecting first base to home plate?

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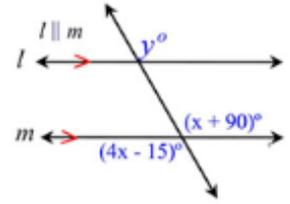
- (A) 90° (B) 60° (C) 45° (D) 30°

- 6]] Given parallelogram ABCD with $m \angle B = 5x$ and $m \angle C = 3x + 4$. Find the number of degrees in $\angle D$.



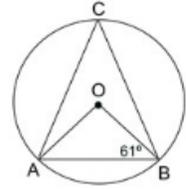
- (A) 115° (B) 110° (C) 73° (D) 70°

- 7]] Given the diagram at the right as marked.
Find the number of degrees in y° .



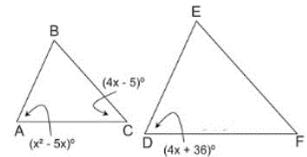
- (A) 35° (B) 55° (C) 125° (D) 135°

- 8]] In circle O , $m \angle ABO = 61^\circ$. Find $m \angle ACB$



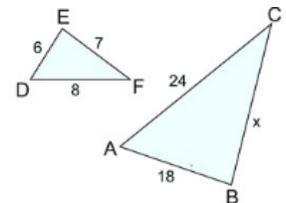
- (A) 61° (B) 58° (C) 30.5° (D) 29°

- 9]] $\triangle ABC$ is similar to $\triangle DEF$. $m \angle BAC = (x^2 - 5x)^\circ$, $m \angle BCA = (4x - 5)^\circ$ and $m \angle EDF = (4x + 36)^\circ$. Find $m \angle F$.



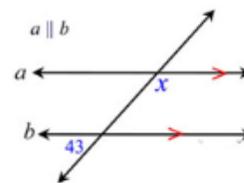
- (A) 43° (B) 36° (C) 30° (D) 12°

- 10]] $\triangle ABC$ is similar to $\triangle DEF$, as shown at the right.
Find BC .



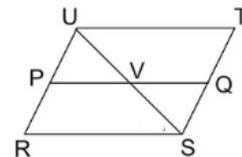
- (A) 6 (B) 7 (C) 18 (D) 21

11]] Find the measure of the angle marked with the x .



- (A) 147° (B) 137° (C) 86° (D) 43°

12]] A parallelogram $RSTU$; diagonal \overline{US} , P midpoint \overline{RU} , Q midpoint \overline{ST}
Which method could be used to prove $\triangle PVU \cong \triangle QVS$?



- (A) SSS (B) SAS (C) ASA (D) HL

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13]] Find the length of \overline{AB} where $A (-4, -6)$ and $B (1, -3)$.

- (A) $\sqrt{106}$ (B) $\sqrt{90}$ (C) $\sqrt{34}$ (D) $\sqrt{18}$

14]] Write the equation of a circle whose center is $(-4, 8)$ and passes through the point $(-2, -1)$.

- (A) $(x - 4)^2 + (y - 8)^2 = 40$ (C) $(x + 2)^2 + (y + 1)^2 = 40$
(B) $(x + 4)^2 + (y - 8)^2 = 85$ (D) $(x + 2)^2 + (y + 1)^2 = 85$

15]] Simplify $3\sqrt{5} - 4\sqrt{5}$ in radical form:

- (A) $-\sqrt{5}$ (B) $\sqrt{5}$ (C) $7\sqrt{5}$ (D) $12\sqrt{5}$

16]] The center portion of a rectangular barn door has diagonal braces from D to B and from C to A.



(a) If $AB = 32.5$ inches and $CB = 68.2$ inches, find DB , to the nearest tenth of an inch.

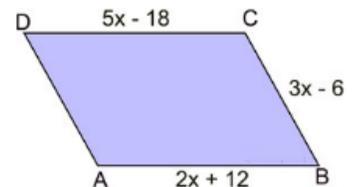
- (A) 72.8 inches (B) 75.5 inches (C) 94.6 inches (D) 100.7 inches

(b) If the white border around the door is consistently 6 inches wide, what is the vertical length from the bottom of the door to the center point of the door, to the nearest inch?

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- (A) 34 inches (B) 38 inches (C) 40 inches (D) 54 inches

17]] The sides of parallelogram ABCD are represented as shown. Find DA.

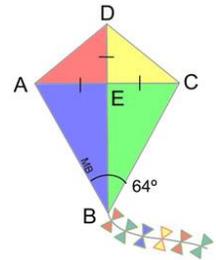


- (A) 10 (B) 12 (C) 24 (D) 30

18]] $(x-2)^2 = \dots\dots\dots$

- (A) $x^2 - 4x - 4$ (B) $4 + 4x + x^2$ (C) $(2-x)^2$ (D) $(x+2)^2$

19]] Ruqaya built the kite shown at the right with $AE = EC = DE$.



(a) Find $m\angle DCE$.

(A) 32°

(B) 45°

(C) 58°

(D) 64°

(b) If $m\angle ABC = 64^\circ$, what is the $m\angle ACB$?

(A) 32°

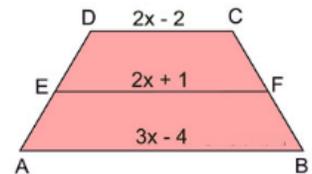
(B) 45°

(C) 58°

(D) 64°

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20]] Given trapezoid $ABCD$ with median \overline{EF} (labeled as shown). Find EF ?



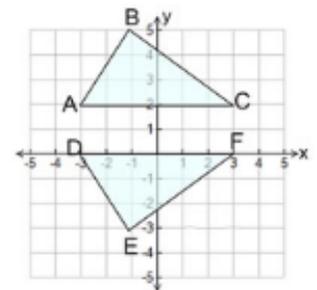
(A) 8

(B) 14

(C) 17

(D) 19

21]] Which rigid transformation will verify that $\triangle ABC$ is congruent to $\triangle DEF$, as shown at the right?



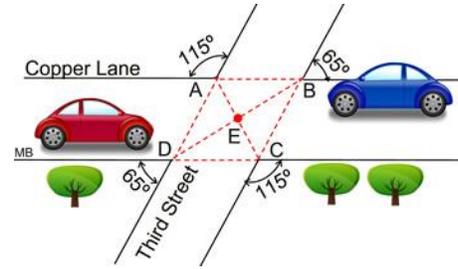
(A) reflection in the y -axis

(C) translation $T_{0,-2}$

(B) reflection in the x -axis

(D) reflection in the line $y = 1$

22]] Copper Lane and Third Street intersect as shown.



You may assume that both streets have the same width.

(a) Which type of quadrilateral best describes ABCD? Justify your answer.

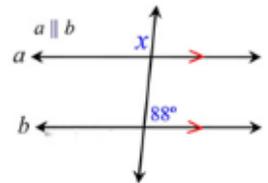
- (A) Parallelogram (B) Rhombus (C) Square (D) Rectangle

(b) Find $m\angle BEC$

- (A) 25° (B) 65° (C) 90° (D) 95°

23]] Find the measure of the angle marked with the x .

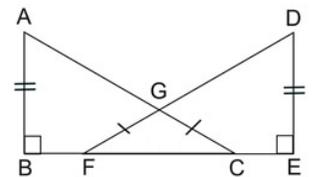
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- (A) 44° (B) 88° (C) 92° (D) 102°

24]] Given right $\triangle ABC$ and right $\triangle DEF$ marked as shown at the right. $\triangle FGC$ is isosceles.

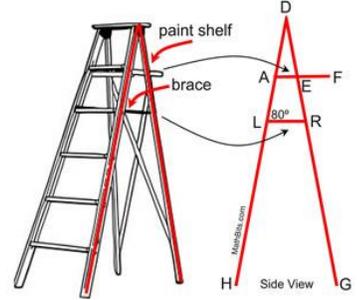
Which of the following methods will prove $\triangle ABC$ is congruent to $\triangle DEF$?



- (A) Angle-Side-Angle (C) Hypotenuse-Leg
 (B) Angle-Angle-Side (D) Side-Angle-Side

25]] A ster-ladder is a ladder commonly used for painting. When it is opened, the paint shelf and the ladder braces will be parallel. $m\angle ALR = 80^\circ$.

(a) Find $m\angle DAE$.



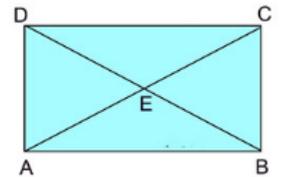
- (A) 100° (B) 80° (C) 40° (D) 20°

(b) Find $m\angle ERL$. Justify answer.

- (A) 100° (B) 80° (C) 40° (D) 20°

26]] In rectangle $ABCD$, $AE = 3x + y$, $EC = 2x + y + 7$ and $DE = 2y + 3x - 1$. Find the values of x and y .

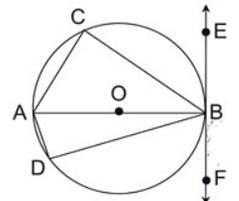
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- (A) $x = 7; y = 1$ (B) $x = 7; y = -1$ (C) $x = 2; y = 6.5$ (D) $x = 4; y = -3.5$

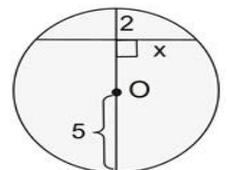
27]] Circle O has diameter \overline{AB} and tangent \overline{EF} at point B .

Which of the following angles is not a right angle?



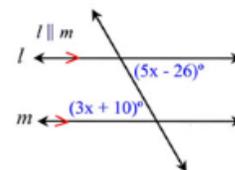
- (A) $\angle ACB$ (B) $\angle ADB$ (C) $\angle EBA$ (D) $\angle FBD$

28]] Given circle O with a diameter perpendicular to a chord, as shown. Find x .



- (A) 3 (B) 4 (C) 5 (D) 8

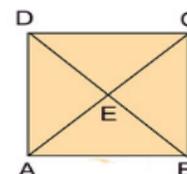
- 29]]** Given the diagram at the right as marked.
What is the value of x ?



- (A) 18 (B) 20.5 (C) 64 (D) 72

- 30]]** Given square $ABCD$ with diagonals \overline{AC} , \overline{BD}

If $DB = 7x + 1$ and $AE = 2x + 11$, find EB ?



- (A) 18 (B) 20.5 (C) 64 (D) 72

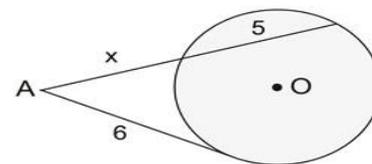
- 31]]** Simplify $(3x^2 - 2)(2x + 4) - 2x^2 + 6x + 7$

- (A) $4x^2 + 14x - 1$ (C) $4x^2 + 14x + 15$
 (B) $6x^3 + 12x + 2x - 1$ (D) $6x^3 + 10x^2 + 2x - 1$

- 32]]** Given the equation of a circle, $(x - 5)^2 + (y + 3)^2 = 196$,
State the coordinates of the center and the radius.

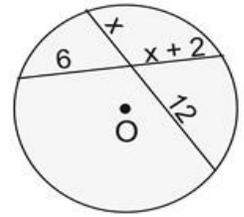
- (A) center $(-5,3)$, radius 13 (C) center $(5,-3)$, radius 13
 (B) center $(-5,3)$, radius 14 (D) center $(5,-3)$, radius 14

- 33]]** Given circle O with a secant and tangent intersecting at A . Find x .



- (A) 1 (B) 4 (C) 8 (D) 9

34]] Given circle O with chords as marked. Find x .



- (A) 2 (B) 3 (C) 4 (D) 5

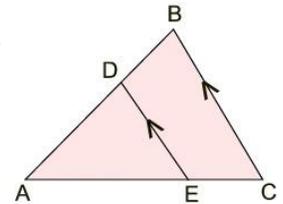
35]] State the coordinates of the center and the radius of a circle whose equation is

$$x^2 + y^2 + 2x - 4y - 11 = 0$$

- (A) center $(-1, 2)$, radius 4 (C) center $(1, -2)$, radius $\sqrt{11}$
 (B) center $(-1, 2)$, radius $\sqrt{11}$ (D) center $(1, -2)$, radius 4

36]] If $AB = AC$, which of the following statements is FALSE?

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- (A) $AD = AE$ (B) $DB = EC$ (C) $\frac{AD}{DB} = \frac{AE}{EC}$ (D) $\frac{AD}{DE} = \frac{DE}{BC}$

37]] Identify the asymptotes of the following function.

$$y = \frac{1}{x} + 2$$

- (A) $x = 0, y = 2$ (B) $x = 0, y = -2$ (C) $x = 1, y = 2$ (D) $x = 1, y = -2$

38]] $F(x) = 3\sqrt{5}$ State the domain and range

- (A) Domain: $x \geq 0$, Range: $y \geq 0$ (C) Domain: $x \geq -5$, Range: $y \geq 0$
 (B) Domain: $x \leq 0$, Range: $y \geq 0$ (D) Domain: $x \geq 0$, Range: $y \leq 0$

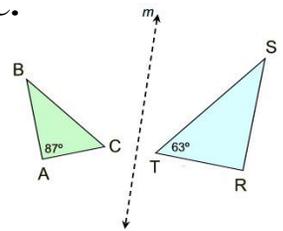
39]] Write an equation in slope-intercept form with a slope of $\frac{1}{5}$ and y-intercept of 4?

- (A) $y = \frac{1}{5} + 4x$ (B) $y = \frac{x}{5} + 4$ (C) $y = \frac{1}{5} - 4x$ (D) $y = 4 - \frac{1}{5}x$

40]] Write the equation of a circle whose center is $(-4,8)$ and passes through the point $(-2,-1)$.

- (A) $(x - 4)^2 + (y - 8)^2 = 40$ (C) $(x + 2)^2 + (y + 1)^2 = 40$
 (B) $(x + 4)^2 + (y - 8)^2 = 85$ (D) $(x + 2)^2 + (y + 1)^2 = 85$

41]] $\triangle RST$ was dilated and then reflected over line m to create image $\triangle ABC$. Which angle in the image is 63° ?

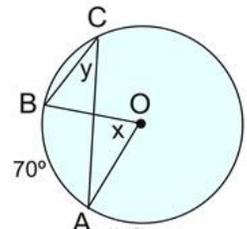


- (A) $\angle R$ (B) $\angle C$ (C) $\angle S$ (D) $\angle B$

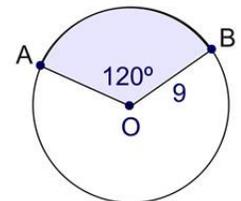
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42]] Given circle O as shown. Find x and y .

- (A) $x = 35^\circ, y = 35^\circ$ (C) $x = 35^\circ, y = 17.5^\circ$
 (B) $x = 35^\circ, y = 70^\circ$ (D) $x = 70^\circ, y = 35^\circ$

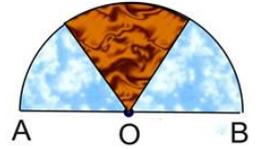


43]] Find the area of the sector shown at the right. The radius of the circle is 9 cm. and the central angle of the sector is 120° . Express the answer to the nearest tenth of a square centimeter.



- (A) 18.8 cm^2 (B) 54.4 cm^2 (C) 84.8 cm^2 (D) 98.1 cm^2

- 44]]** A stained glass window is made in the shape of a semicircle. The window contains three congruent sections. If $AB = 6$ ft, find the area of each section of the window, to the nearest square foot.



- (A) 34 ft^2 (B) 19 ft^2 (C) 12 ft^2 (D) 5 ft^2

- 45]]** Which of the following is an equation of the line perpendicular to $4x - 2y = 6$ and passing through $(4, -4)$?

(A) $y = \frac{3}{4}x + 3$ (C) $y = -\frac{3}{4}x - 1$

(D) $y = -\frac{1}{2}x - 4$ (D) $y = -\frac{1}{2}x - 2$

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- 46]]** Which of the following is a quadrilateral with exactly one pair of parallel sides?

- (A) Parallelogram (B) Rhombus (C) Square (D) Trapezoid

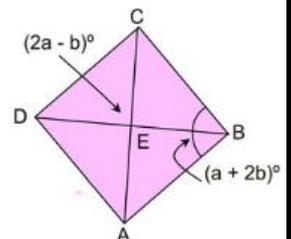
- 47]]** What is the solution of the following equation?

$$\frac{1}{n-2} = \frac{n}{8}$$

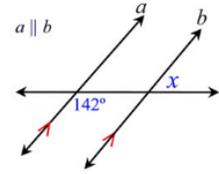
- (A) $\{-2\}$ (B) $\{4\}$ (C) $\{2, -4\}$ (D) $\{-2, 4\}$

- 48]]** Given square $ABCD$ with diagonals \overline{AC} , \overline{BD} The $m\angle DEC = 2a + b$ and $m\angle ABC = a + 2b$. Find a and b ?

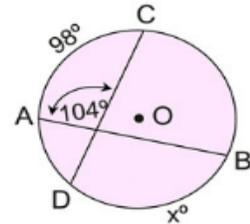
- (A) $a = 30; b = 30$ (C) $a = 54; b = 18$
 (B) $a = 42; b = 24$ (D) $a = 60; b = 15$



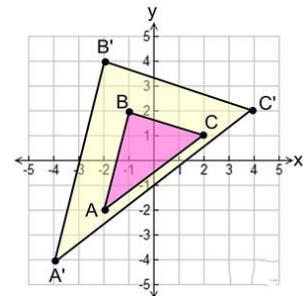
49]] Find the measure of the angle marked with the x .

(A) 142° (B) 71° (C) 38° (D) 32°

50]] Given circle O as shown. Find x .

(A) 120° (B) 110° (C) 104° (D) 98°

51]] $\triangle ABC$ has $A(-2,-2)$, $B(-1,2)$ and $C(2,1)$. After a dilation centered at the origin, $\triangle A'B'C'$ has $A'(-4,-4)$, $B'(-2,4)$ and $C'(4,2)$. What is the scale factor of the dilation?



(A) -2

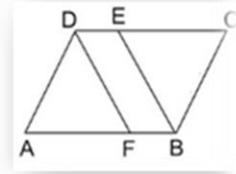
(B) 2

(C) $\frac{1}{2}$ (D) $-\frac{1}{2}$

Question: 2

Write all steps of the solution for the following questions:

- (1) Given: $BCDA$ is a parallelogram , $\overline{AF} \cong \overline{CE}$



Prove: $FBED$ is a parallelogram?

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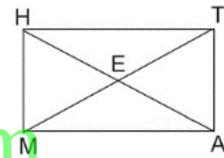
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- (2) Given: Rectangle $MATH$, diagonals \overline{MT} , \overline{AH}



Prove: Triangle MEA is a isosceles

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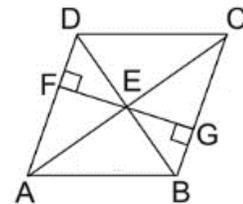
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- (3) Given: Rhombus $ABCD$, diagonals \overline{DB} , \overline{AC} , $\overline{EG} \perp \overline{CB}$, $\overline{EF} \perp \overline{AD}$

Prove: $\overline{EF} \cong \overline{EG}$



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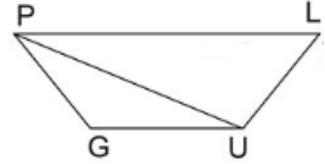
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(4) Given: Quadrilateral $GULP$, $\overline{PG} \cong \overline{GU}$, \overline{PU} bisects $\angle GPL$

Prove: $GULP$ is a trapezoid.



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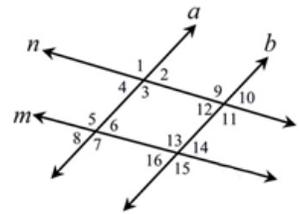
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(5) Given: $m \parallel n$ and $a \parallel b$

Prove: $\angle 3 \cong \angle 13$



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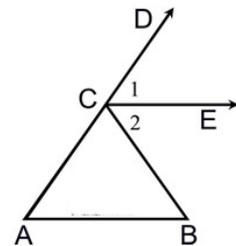
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(6) Given: $\overline{CE} \parallel \overline{AB}$, \overline{CE} bisect $\angle DEB$

Prove: $\angle A \cong \angle B$



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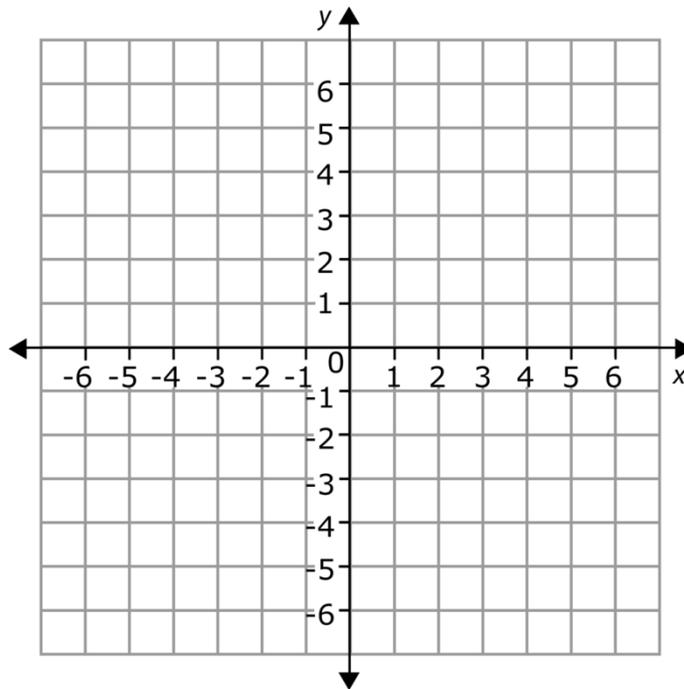
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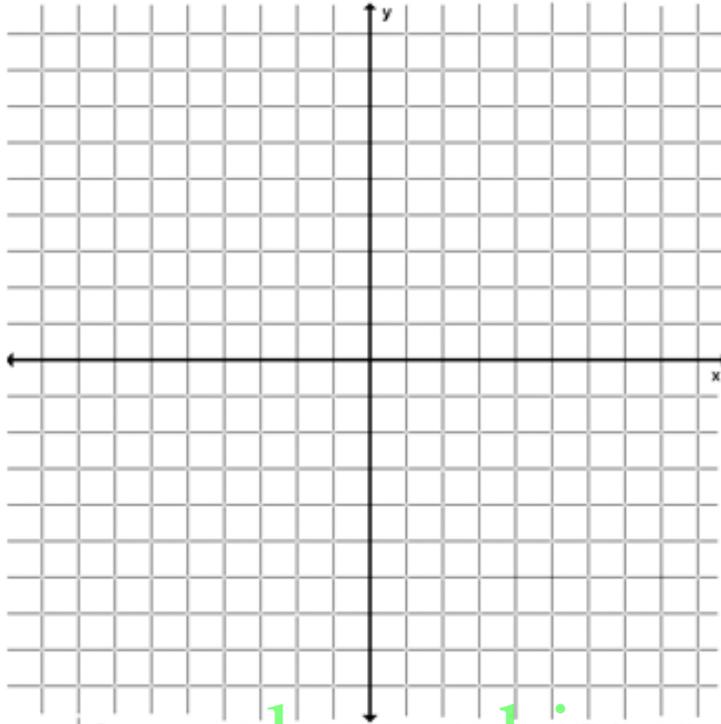
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(7) The coordinates of quadrilateral ABCD are located at $A(-2,3)$, $B(4,5)$, $C(6,-1)$ and $D(0,-3)$.



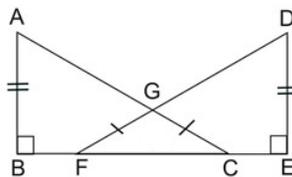
- a) Using coordinate geometry methods, show that the diagonals bisect each other.
- b) Using coordinate geometry methods, show that the diagonals are perpendicular.
- c) Using coordinate geometry methods, show that all four sides are congruent.
- d) Based only upon the information shown in parts a, b and c, what name can be given to this quadrilateral?

- (8) Graph the rectangle ABCD and its image under the given reflection with vertices A (-5, 2), B (1, 2), C (1,-1) and D (-5,-1) in the line $y=-1$



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- (9) Given right $\triangle ABC$ and right $\triangle DEF$ marked as shown at the right. $\triangle FGC$ is isosceles. Prove $\triangle ABC$ is congruent to $\triangle DEF$?



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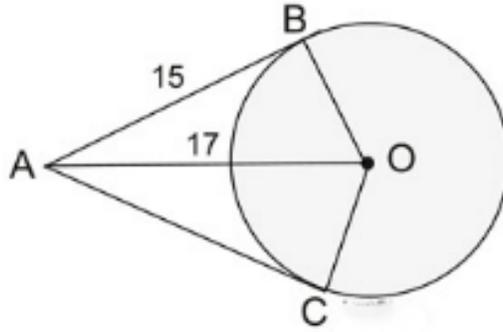
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- (10) Given circle O with tangents \overline{AB} and \overline{AC} . If $AB = 15\text{cm}$ and $AO = 17\text{cm}$, Find OC



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