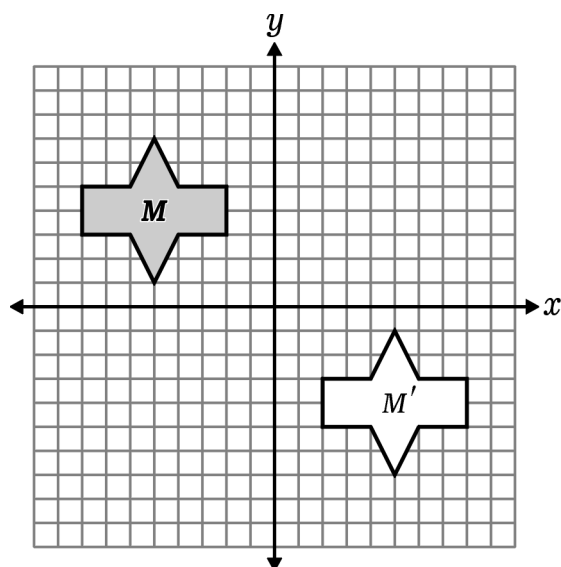**Name:** _____ **Date:** _____

1. In the diagram, M and M' are congruent.

Which of the following is *not* a way of transforming M into M'?

A. a rotation of $180°$ about the origin

B. a reflection across the x-axis, then a reflection across the y-axis

C. a reflection across the y-axis, then a translation down 2 units

D. a translation down 8 units, then a translation right 10 units

2. Which of the following is *not* a congruence transformation for a two-dimensional figure?

A. dilation   B. rotation

C. reflection   D. translation

3. A translation maps $J(1, 4)$ onto $K(7, -3)$. Find the coordinates of the image of $L(5, 10)$ under the same translation.

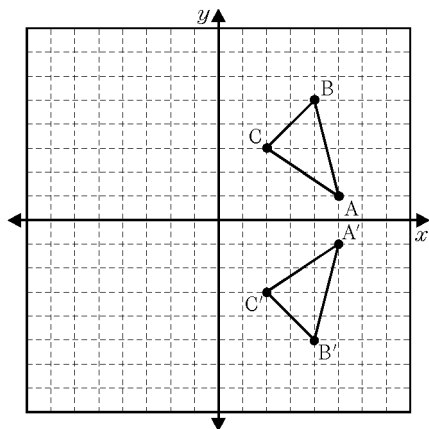A. $(11, 3)$ B. $(-1, 17)$

C. $(-11, 7)$ D. $(-1, -17)$

4. A translation moves $A(-3, 2)$ to $A'(0, 0)$. Find B', the image of $B(5, 4)$, under the same translation.

A. $(8, 2)$ B. $(7, 3)$

C. $(-2, -1)$ D. $(-8, -2)$

5. $\triangle STV$ has vertices $S(-3, -2)$, $T(-4, 3)$ and $V(-2, 3)$. If $(x, y) \rightarrow (x + 2, y - 3)$, what are the vertices of its image?
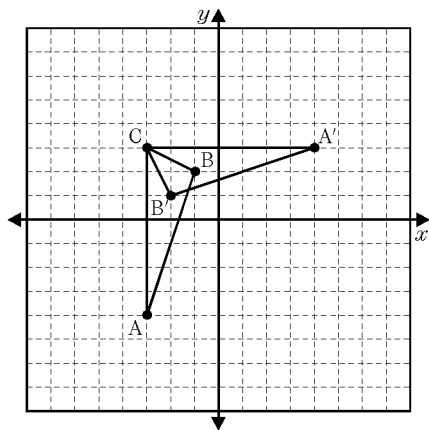
A. $S'(-1, -5)$, $T'(-2, 0)$, $V'(0, 0)$

B. $S'(-1, -4)$, $T'(-2, 5)$, $V'(1, 6)$

C. $S'(0, 1)$, $T'(-1, 6)$, $V'(0, 5)$

D. $S'(3, 2)$, $T'(4, -3)$, $V'(2, -3)$

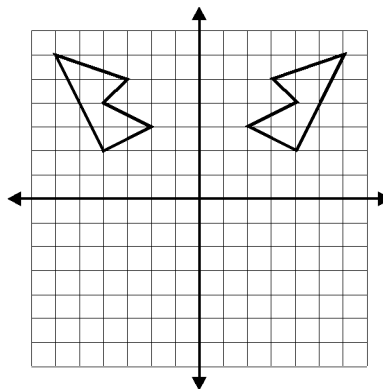6. What is the mapping for the reflection where △ABC maps to △A'B'C' ?

A. $(x, y) \rightarrow (x, -y)$ B. $(x, y) \rightarrow (-x, -y)$

C. $(x, y) \rightarrow (x, y)$ D. $(x, y) \rightarrow (x, -\frac{1}{2}y)$

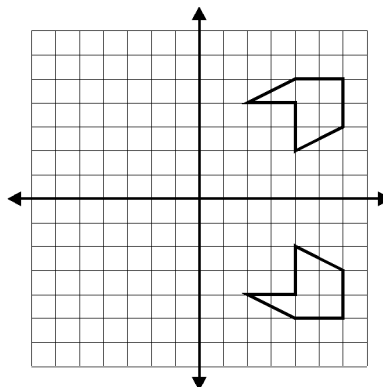7. What is the mapping for the reflection where △ABC maps to △A'B'C ?

A. $(x, y) \rightarrow (x, -y)$ B. $(x, y) \rightarrow (-y, -x)$

C. $(x, y) \rightarrow (-x, y)$ D. $(x, y) \rightarrow (-y, x)$

8. Which of the following is the correct mapping for shape A to shape B?
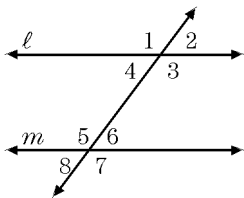

A. $(x, y) \rightarrow (-x, y)$ B. $(x, y) \rightarrow (x, -y)$

C. $(x, y) \rightarrow (x, y - 4)$ D. $(x, y) \rightarrow (x - 7, -y)$

9. Which of the following is the correct mapping for shape A to shape B?

A. $(x, y) \rightarrow (-x, -y)$ B. $(x, y) \rightarrow (x, -y)$

C. $(x, y) \rightarrow (-x, y + 2)$ D. $(x, y) \rightarrow (x - 3, y)$

10. The Corresponding Angles Conjecture states that if two parallel lines are cut by a transversal, the corresponding angles are congruent. The picture below shows this relationship.

Which of these congruent angles are corresponding angles?

A. ∠1 and ∠4

B. ∠1 and ∠3

C. ∠4 and ∠8

D. ∠4 and ∠3

11. The Corresponding Angles Conjecture states that if two parallel lines are cut by a transversal, the alternate interior angles are congruent. The picture below shows this relationship.
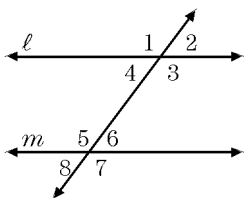
To test this conjecture, which pair of congruent angles are alternate interior angles?

A. ∠1 and ∠4

B. ∠2 and ∠8

C. ∠4 and ∠8

D. ∠3 and ∠5

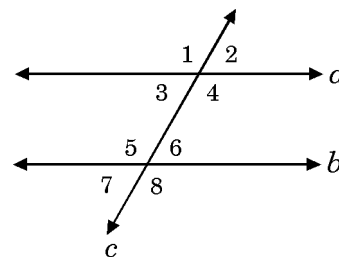12. In the diagram, if $m\angle 8 = m\angle 12$, which two lines (if any) must be parallel?
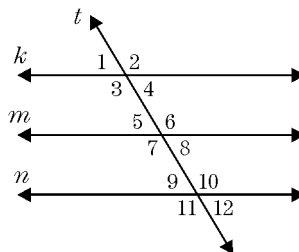
A. $k \parallel m$

B. $m \parallel n$

C. $k \parallel m \parallel n$

D. none are parallel

13. In the diagram, if $m\angle 1 = m\angle 9$, which two lines (if any) must be parallel?

A. $k \parallel n$

B. $m \parallel n$

C. $k \parallel m \parallel n$

D. none are parallel

14. In the diagram, if lines a and b are parallel, which of the following must be true?
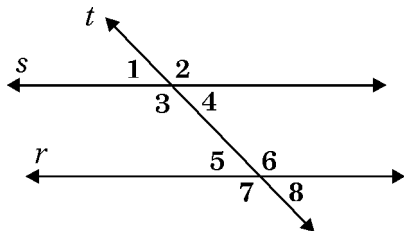
A. $\angle 2 \cong \angle 5$

B. $\angle 3 \cong \angle 4$

C. $\angle 4 \cong \angle 5$

D. $\angle 8 \cong \angle 2$

15. In the diagram, if lines *a* and *b* are parallel, which of the following must be true?

    A. ∠7 ≅ ∠1   B. ∠7 ≅ ∠4
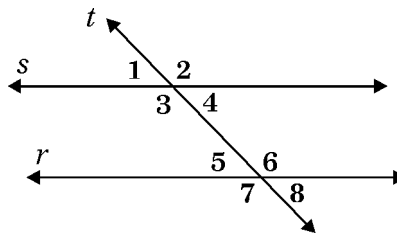
    C. ∠3 ≅ ∠6   D. ∠8 ≅ ∠3

16.

Lines *r* and *s* are cut by a transversal, as shown. If you know that the lines are parallel, then which of the following angle pairs must be supplementary?

    I. ∠1, ∠4

    II. ∠3, ∠5

    III. ∠1, ∠6

    IV. ∠2, ∠8

    A. II only   B. II and IV only

    C. II, III and IV only   D. all of them

17.

Lines *r* and *s* are cut by a transversal, as shown. Which of the following angle pairs, if congruent, will help you prove that the lines are parallel?

    I. ∠1, ∠4

    II. ∠3, ∠5

    III. ∠2, ∠6

    IV. ∠1, ∠8

    A. I only   B. III and IV only

    C. I, III and IV only   D. all of them

18. The two segments formed as a result of a bisector will always be _____ .

    A. proportional   B. congruent

    C. parallel   D. perpendicular

          EOC Prep #1

19. The angles formed by a perpendicular bisector each have a measure—

    A. greater than 90 degrees

    B. less than 90 degrees

    C. equal to 180 degrees

    D. equal to 90 degrees

20. The measure of each interior angle of a regular polygon is 150°. Tandra used the fact that the sum of the exterior angles of any polygon is 360° to show that the polygon has 12 sides. Her steps are as follows:

    1) The sum of the exterior angles $= 360$

    2) Each exterior angle $= \dfrac{360}{n}$

    3) $\dfrac{360}{n} = 180 - 150$

    4) $\dfrac{360}{n} = 30$

    5) $360 = 30n$

    6) $12 = n$

    If the teacher asks Tandra to justify her reasoning for the third step, what should Tandra answer?

    A. Each exterior angle is supplementary with an interior angle.

    B. The sum of the angles is 180°.

    C. Each exterior angle is complementary with an interior angle.

    D. 180° is half of 360°.

21. The measure of each interior angle of a regular polygon is 156°. Raymond used the fact that the sum of the exterior angles of any polygon is 360° to show that the polygon has 15 sides. His work is shown below:

    1) The sum of the exterior angles $= 360$

    2) Each exterior angle $= \dfrac{360}{n}$

    3) $\dfrac{360}{n} = 180 - 156$

    4) $\dfrac{360}{n} = 24$

    5) $360 = 24n$

    6) $15 = n$

    If the teacher asks Raymond to justify his reasoning for the second step, what should Raymond answer?

    A. Each exterior angle is supplementary with an interior angle.

    B. If the polygon is regular, the exterior angles are congruent.

    C. Each exterior angle is complementary with an interior angle.

    D. The number of angles is twice the number of sides.

22.
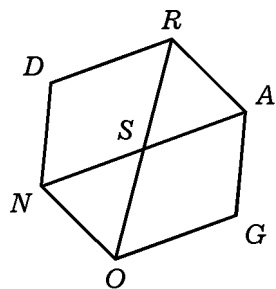
In hexagon DRAGON the diagonals $\overline{RO}$ and $\overline{AN}$ bisect each other. Jared's geometry class is writing a proof to show that $\overline{RA} \cong \overline{ON}$.
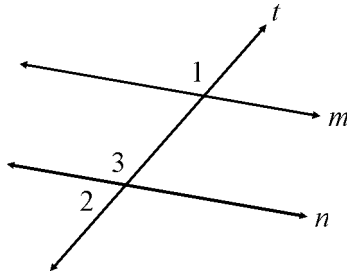
Statement	Reason
1. $\overline{RO}$ bisects $\overline{AN}$, $\overline{AN}$ bisects $\overline{RO}$	1. given
2. $\overline{RS} \cong \overline{SO}$, $\overline{AS} \cong \overline{SN}$	2. Definition of segment bisector
3. $\angle OSN \cong \angle ASR$	3. _____
4. $\triangle NOS \cong \triangle ARS$	4. SAS
5. $\overline{RA} \cong \overline{ON}$	5. CPCTC

The teacher asks Jared to justify step three. What should he answer?

A.   Adjacent angles are congruent.

B.   Vertical angles are congruent.

C.   Alternate Interior angles are congruent.

D.   Definition of angle bisector.

23. Given: ∠1 and ∠2 are supplementary

Prove: *m* ∥ *n*

| Statement	Reason
1. ∠1 and ∠2 are suppl.	Given
2. $m\angle 1 + m\angle 2 = 180$	def'n of suppl. angles
3. $m\angle 3 + m\angle 2 = 180$	def'n of straight angles
4. $m\angle 1 - m\angle 3 = 0$	subtr. property of equality
5. $m\angle 1 = m\angle 3$	add. property of equality
6. *m* ∥ *n*	

In the proof, what is the reason for statement 6?

A. If two lines are cut by a transversal, and the alternate interior angles are congruent, then the lines are parallel.

B. If two lines are cut by a transversal, and the same-side interior angles are congruent, then the lines are parallel.

C. If two lines are cut by a transversal, and the alternate exterior angles are congruent, then the lines are parallel.

D. If two lines are cut by a transversal, and the corresponding angles are congruent, then the lines are parallel.

24. Given that triangle *ABC* is similar to triangle *DEC*, ∠*ABC* corresponds to:

   A. ∠*CDE*
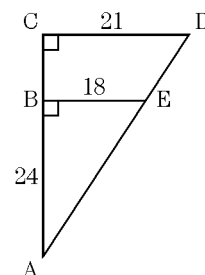
   B. ∠*DEC*

   C. ∠*ACB*

   D. ∠*ECD*
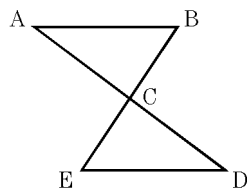
25. In the figure, $\overline{DE} \parallel \overline{BC}$. Which proportion is *not* true?
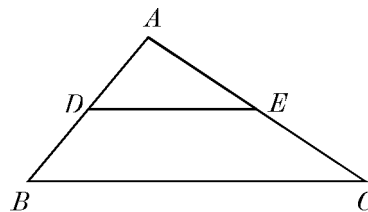
   A. $\dfrac{AD}{BA} = \dfrac{AE}{CA}$ B. $\dfrac{AD}{AE} = \dfrac{AB}{AC}$

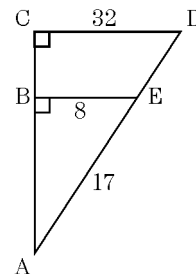   C. $\dfrac{DB}{EC} = \dfrac{BA}{CA}$ D. $\dfrac{AD}{DB} = \dfrac{AE}{AC}$

26. In the diagram, $\overline{CD} \perp \overline{AC}$, $\overline{BE} \perp \overline{AC}$, $AB = 24$, $BE = 18$, and $CD = 21$. Find *BC*.

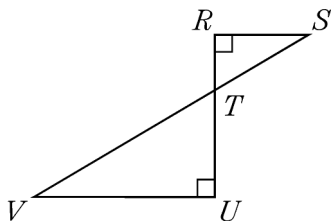   A. 4   B. 5

   C. 30   D. 35

27. In the diagram, $\overline{CD} \perp \overline{AC}$, $\overline{BE} \perp \overline{AC}$, $AE = 17$, $BE = 8$, and $CD = 32$. Find *DE*.

   A. 35   B. 45

   C. 51   D. 68

28. In the figure, $RS = 6$, $RT = 4$, and $TU = 6$. What is the length of $\overline{UV}$?

A. 10

B. 9

C. 4

D. not enough information

31. Given the triangle shown, which of the following is true?

A. $\sin B = \dfrac{c}{b}$

B. $\cos A = \dfrac{c}{b}$

C. $\tan A = \dfrac{b}{a}$

D. $\sin B = \dfrac{b}{c}$

29. In the figure, $RS = 6$, $RT = 4$, and $TU = 10$. What is the length of $\overline{UV}$?

A. 15   B. 9   C. 4

D. not enough information
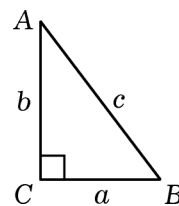
32. Given the triangle shown, which of the following is true?

A. $\sin B = \dfrac{c}{b}$ B. $\cos A = \dfrac{b}{c}$

C. $\tan A = \dfrac{b}{a}$ D. $\sin B = \dfrac{a}{c}$
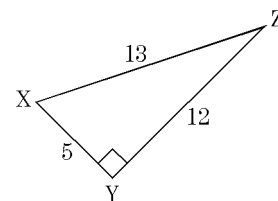
30. Which of the following ratios is the tangent of an angle?

A. $\dfrac{\text{opposite}}{\text{hypotenuse}}$ B. $\dfrac{\text{hypotenuse}}{\text{adjacent}}$

C. $\dfrac{\text{hypotenuse}}{\text{opposite}}$ D. $\dfrac{\text{opposite}}{\text{adjacent}}$
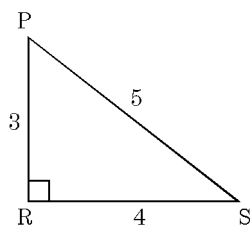
33. Which of the following statements is *incorrect* for $\triangle XYZ$?

A. $\sin Z = \frac{5}{13}$

B. $\tan Y = \frac{5}{12}$
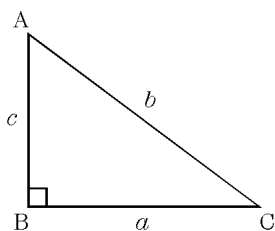
C. $XZ = 13$

D. $\cos X = \frac{5}{13}$

34. Which of the following statements is *incorrect* for the given diagram?

A. $\sin S = \frac{3}{5}$

B. $\cos S = \frac{4}{5}$

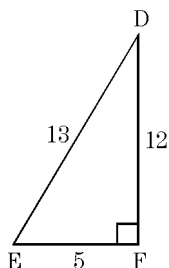C. $\tan S = \frac{5}{4}$

D. $\triangle PRS$ is a right triangle

35. Which of the following statements is *incorrect* for $\triangle ABC$?

A. $\sin A = \dfrac{c}{b}$

B. $\cos C = \dfrac{a}{b}$

C. $\tan A = \dfrac{a}{c}$

D. $\tan C = \dfrac{c}{a}$

36. In $\triangle DEF$, which of the following is equal to $\frac{5}{12}$?

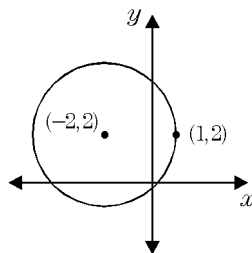A. $\sin E$ B. $\cos D$

C. $\tan D$ D. $\tan E$

37. If $\sin \angle A = \frac{3}{5}$ and $\cos \angle A = \frac{4}{5}$, what is $\tan \angle A$?

A. $\frac{4}{3}$ B. $\frac{3}{4}$ C. $\frac{7}{5}$ D. $\frac{1}{5}$

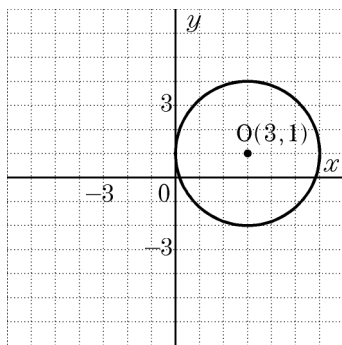38. The sides of a right triangle are 5, 12, and 13. The sine of the smallest angle is

A. $\frac{5}{12}$ B. $\frac{5}{13}$ C. $\frac{12}{13}$ D. $\frac{13}{5}$
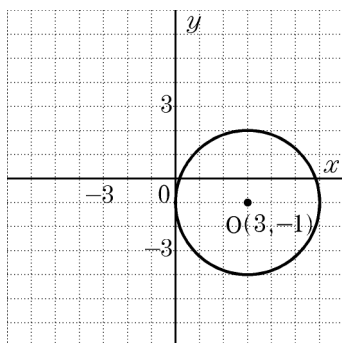
39. What is the equation of the circle shown below?

A. $(x - 2)^2 + (y + 2)^2 = 9$

B. $(x + 2)^2 + (y - 2)^2 = 9$

C. $(x - 2)^2 + (y + 2)^2 = 3$

D. $(x + 2)^2 + (y - 2)^2 = 1$

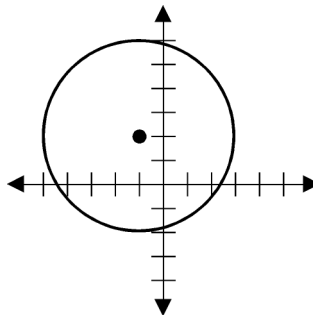EOC Prep #1

40. Write the equation for the circle.

A. $(x-3)^2 + (y-1)^2 = 9$

B. $(x-3)^2 + (y+1)^2 = \sqrt{3}$

C. $(x+3)^2 + (y-1)^2 = \sqrt{3}$

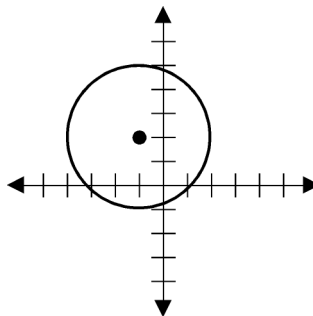D. $(x-3)^2 + (y+1)^2 = 9$

41. Write the equation for the circle.

A. $(x+3)^2 + (y-1)^2 = 9$

B. $(x-3)^2 + (y+1)^2 = \sqrt{3}$

C. $(x+3)^2 + (y-1)^2 = \sqrt{3}$

D. $(x-3)^2 + (y+1)^2 = 9$

42. Which of the following is the equation of the circle shown?

A. $(x+1)^2 + (y-2)^2 = 16$

B. $(x-1)^2 + (y+2)^2 = 4$

C. $(x+1)^2 + (y-2)^2 = 4$

D. $(x-1)^2 + (y+2)^2 = 16$

43. The circle $(x+1)^2 + (y-2)^2 = 9$ is moved to the right 3 units and down 4 units. What is the equation of this new circle?

A. $(x+4)^2 + (y-6)^2 = 9$

B. $(x+4)^2 + (y+2)^2 = 9$

C. $(x-2)^2 + (y+2)^2 = 9$

D. $(x-2)^2 + (y-6)^2 = 9$

44. Write the equation of the circle with center $(-2, 3)$ and radius 2.

    A. $(x + 2)^2 + (y - 3)^2 = 4$

    B. $(x + 2)^2 + (y + 3)^2 = 4$

    C. $(x - 2)^2 + (y + 3)^2 = 2$

    D. $(x + 2)^2 + (y - 3)^2 = 2$

45. What is the equation of the circle centered at $(4, -5)$ with a radius of 16?

    A. $(x + 4)^2 + (y - 5)^2 = 16$

    B. $(x + 4)^2 + (y - 5)^2 = 256$

    C. $(x - 4)^2 + (y + 5)^2 = 256$

    D. $(x + 4)^2 + (y - 5)^2 = 4$

46. What is the equation of a circle having radius 5 and center $(-3, 2)$?

    A. $(x + 3)^2 + (y - 2)^2 = 5$

    B. $(x + 3)^2 + (y - 2)^2 = 25$

    C. $(x - 3)^2 + (y + 2)^2 = 5$

    D. $(x - 3)^2 + (y + 2)^2 = 25$

47. What is the equation of a circle having radius 1 and center $(1, 2)$?
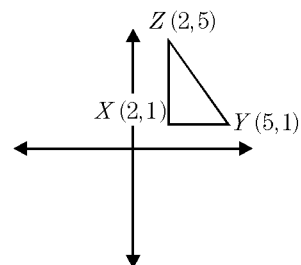
    A. $(x + 1)^2 + (y + 2)^2 = 1$

    B. $(x + 2)^2 + (y + 1)^2 = 1$

    C. $(x - 1)^2 + (y - 2)^2 = 1$

    D. $(x + 1)^2 + (y - 2)^2 = 1$

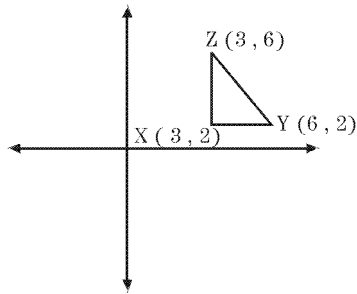48. What is the equation of a circle having radius 8 and center $(2, -7)$?

    A. $(x - 2)^2 + (y + 7)^2 = 8$

    B. $(x + 7)^2 + (y + 7)^2 = 64$

    C. $(x - 2)^2 + (y + 7)^2 = 64$

    D. $\dfrac{(x - 2)^2}{8} - \dfrac{(y + 7)^2}{8} = 1$

49. Given the coordinates of X, Y, and Z, as shown in the figure, find the perimeter of the triangle

    A.   6 units

    B.   11 units

    C.   12 units

    D.   14 units
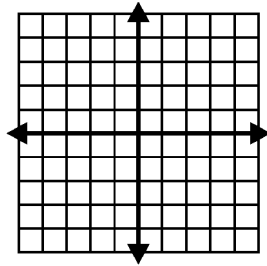
50. Given the coordinates of *X*, *Y*, and *Z*, as shown in the figure, find the perimeter of the triangle.

A.   7 units   B.   11 units

C.   12 units   D.   25 units

51. Use the following graph to find the area of a rectangle with vertices of $(-2, 4)$, $(-2, -4)$, $(1, 4)$, and $(1, -4)$.
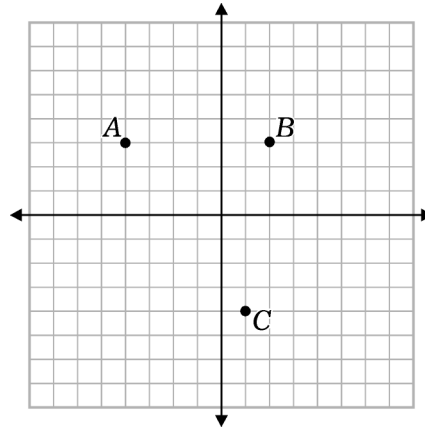
A.   6 units^2

B.   16 units^2

C.   21 units^2

D.   24 units^2

52. Use the following graph to find the area of a rectangle with vertices of $(-3, 1)$, $(-3, -2)$, $(2, 1)$ and $(2, -2)$.
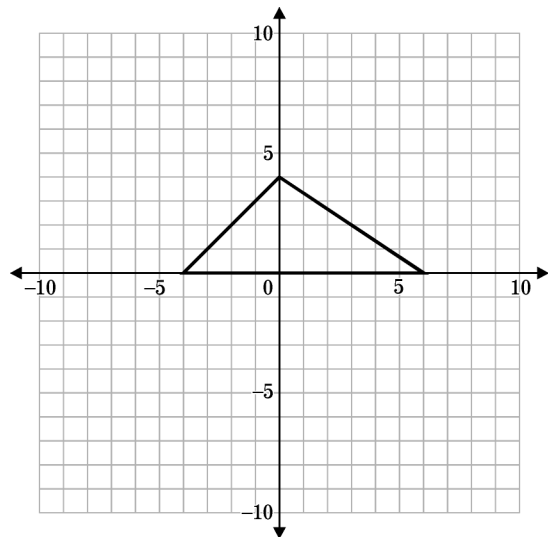
A.   8 units^2 B.   15 units^2

C.   16 units^2 D.   30 units^2

53. Join *A*, *B* and *C* to form $\triangle ABC$. Find the area of $\triangle ABC$.
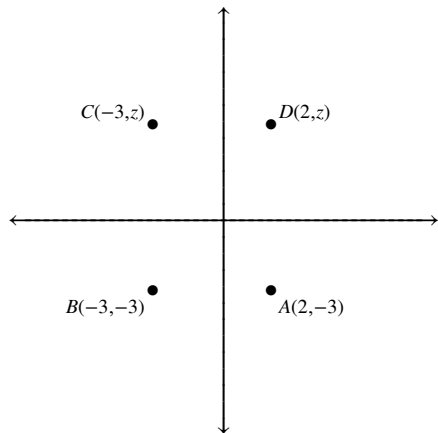

A.   17 square units   B.   21 square units

C.   31 square units   D.   42 square units

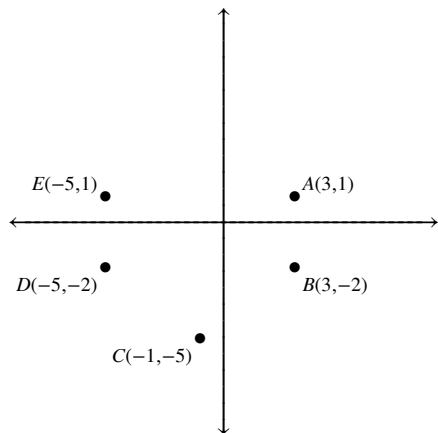54. The formula for area of a triangle is $A = \frac{1}{2}bh$. What is the area of the figure shown?

A.   24 square units   B.   16 square units

C.   40 square units   D.   20 square units

55. In the given figure, □ABCD has an area of 35. What is the value of z?

$C(-3,z)$ •   • $D(2,z)$

• $B(-3,-3)$ • $A(2,-3)$

A. 4   B. 5   C. 6   D. 8

56. Find the area of the pentagon with vertices *ABCDE*.

$E(-5,1)$ •   • $A(3,1)$

•   •
$D(-5,-2)$ $B(3,-2)$

•
$C(-1,-5)$

A. 32 units^2 B. 36 units^2

C. 48 units^2 D. 64 units^2

57. In the diagram, the sphere touches each face of the cube at one point—the center of each face. If each side of the cube is 5 cm, what is a reasonable estimate for the unoccupied volume of the cube?

A. ≈ 70 cm^3

B. ≈ 60 cm^3

C. ≈ 50 cm^3

D. ≈ 40 cm^3