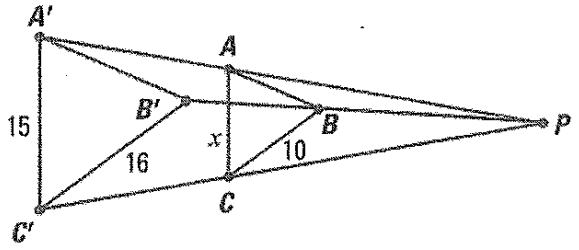
Geometry
Semester Review A
Chapters 1 – 5, 9

Name KEY

Multiple Choice. Choose the best answer.

1. Find the scale factor of the dilation that maps ABC onto $A'B'C'$.

$K = \frac{image}{pre} = \frac{16}{10} = \frac{8}{5}$



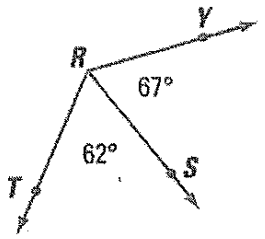
A. $\frac{8}{5}$ B. $\frac{5}{2}$ C. $\frac{5}{8}$ D. $\frac{1}{4}$

2. In ΔXYZ, the coordinates of Y are $(4, 3)$. If ΔXYZ undergoes the composition of the transformations listed below, what are the coordinates of the final image of Y?

Translation: $(x, y) \rightarrow (x + 2, y - 4)$ $(6, -1)$ (4+2, 3−4)
Rotation: 180° about the origin $(-6, 1)$
$(-x, -y)$

A. $(6, -1)$ B. $(-6, -1)$ C. $(6, 1)$ D. $(-6, 1)$

3. What is $m\angle TRY$?



A. 62° B. 67° C. 119° D. 129°

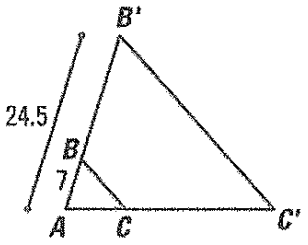
4. In a figure, $\angle X$ and $\angle Y$ are complementary angles and $m\angle X = (a + 4)°$. Which expression can be used to find $m\angle Y$?

$X + Y = 90$
$a+4 + m\angle Y = 90$
$m\angle Y = 90 - (a+4)$

A. $[90 - (a + 4)]°$ B. $[(a + 4) - 180]°$

C. $[90 + (a + 4)]°$ D. $[180 - (a + 4)]°$

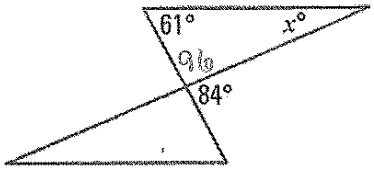
5. A dilation maps ΔABC onto $\Delta A'B'C'$. What is the scale factor of the dilation?



$\frac{24.5}{7} = 3.5$

A. 171.5 B. 31.5 C. 17.5 D. 3.5

6. What is the value of x?



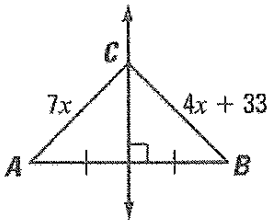
180
−96
−61
23

A. 145 B. 113 C. 35 D. 23

7. What is the length of $\overline{AC}$?

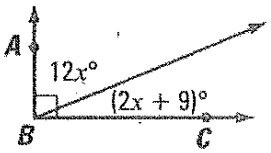
$7x = 4x + 33$
$3x = 33$
$x = 11$

$AC = 7(11)$
$AC = 77$



A. 3 B. 11 C. 21 D. 77

8. Based on the information in the figure, which statement shows a valid argument?



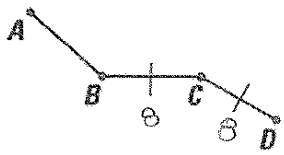
A. $(2x + 9) + 12x = 180$ because the angles form a linear pair.

B. $(2x + 9) + 12x = 90$ because the angles are complementary.

C. $(2x + 9) = 12x$ because the angles are vertical angles.

D. $(2x + 9) = 12x$ because the angles are supplementary.

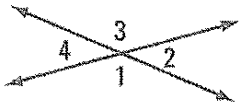
9. For the figure below, what property is used to make the conclusion?



Given: $CD = BC, BC = 8$ **Conclusion:** $CD = 8$

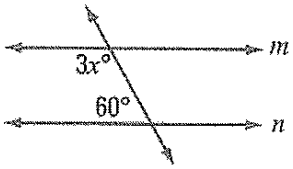
A. Transitive Property of Equality
B. Definition of Congruent Segments
C. Reflexive Property of Equality
D. Segment Addition Postulate

10. Based on the figure, which conclusion is correct?



A. $m\angle 4 = m\angle 2$ because they are a linear pair.
B. $m\angle 4 = m\angle 1$ because they are vertical angles.
C. $m\angle 1 = m\angle 3$ because they are vertical angles.
D. $m\angle 1 = m\angle 2$ because they are a linear pair.

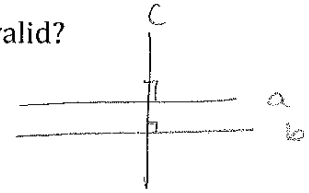
11. For what value of x is $m \parallel n$?



$3x + 60 = 180$
$3x = 120$
$x = 40$

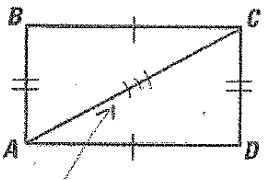
A. 10 B. 20 C. 40 D. 100

12. For three lines, $a, b, and\ c$, $a \parallel b$, and $c \perp a$, which conclusion is valid?



A. $c \perp b$ B. $b \perp a$ C. $a \parallel c$ D. $c \parallel b$

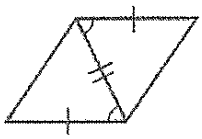
13. Which congruence theorem can be used to show that $\Delta ABC \cong \Delta CDA$?



A. SSS B. ASA C. SAS D. AAS

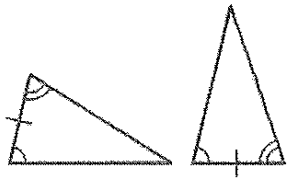
Reflexive prop.

14. Which congruence theorem can be used to show that the triangles are congruent?



A. SSS B. ASA C. SAS D. AAS

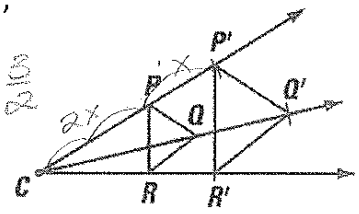
15. Which congruence theorem can be used to show that the triangles are congruent?



A. SSS B. ASA C. SAS D. AAS

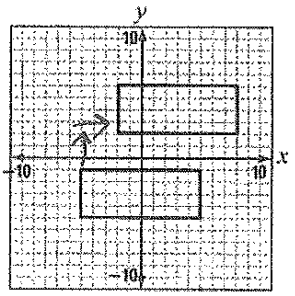
16. The diagram shows an expansion of ΔPQR. If $CP = 2 \cdot PP'$, what is the scale factor of the expansion?

$\frac{CP'}{CP} = \frac{3x}{2x} = \frac{3}{2}$



A. $\frac{1}{3}$ B. $\frac{1}{2}$ C. $\frac{2}{3}$ D. $\frac{3}{2}$

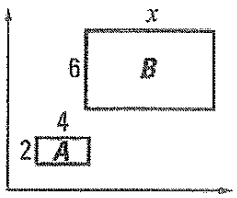
17. What transformation is demonstrated by the picture?



A. rotation B. reflection

C. translation D. dilation

18. In the figure, rectangle B is a dilation of rectangle A. What is x?



A. 3 B. 8

C. 12 D. 24

$2(3) = 6$

$4(3) = 12$

$K = \frac{\text{image } B}{\text{pre } A} = \frac{6}{2} = 3$

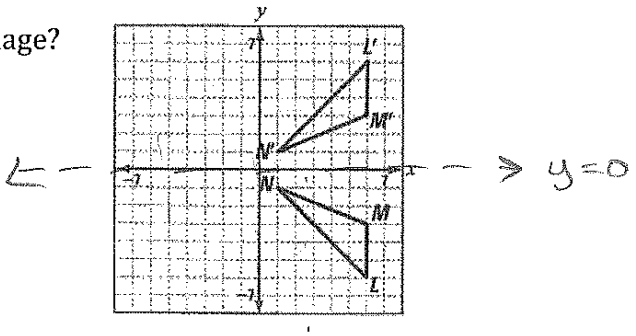
19. What is the line of reflection for ΔLMN and its image?

A. $y = 0$

B. $x = 0$

C. $y = x$

D. $y = -x$



20. In ΔABC, A is at $(4, 2)$. What are the coordinates of the image of A when ΔABC is rotated $270°$ clockwise about the origin?

↳ 90° counter

Rule: $(-y, x)$ interchange the 1st value opposite

$-2, 4$

A. (4, 2) B. (-2, 4) C. (-4, -2) D. (-2, -4)

21. What is the length of the segment with endpoints $(-2, 4)$ and $(6, -2)$?

Distance $\sqrt{(x_1-x_2)^2+(y_1-y_2)^2}$

$\sqrt{8^2+6^2}$

$64+36$

$\sqrt{100} = 10$

A. $\sqrt{18}$ B. $\sqrt{68}$ C. 6 D. 10

22. What is the midpoint of the segment with endpoints (4, 9) and (2, 7)?

$\left(\frac{x+x}{2}, \frac{y+y}{2}\right)$

$\left(\frac{6}{2}, \frac{16}{2}\right)$

$(3, 8)$

A. (6, 16) B. (3, 8) C. (2, 2) D. (6.5, 4.5)

23. What is the missing endpoint of a segment with one endpoint of $(-3, 1)$ and midpoint of $(3, -11)$?

Algebraically

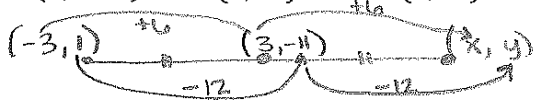
$\frac{-3+x}{2} = 3$ $\quad \frac{1+y}{2} = -11$

$-3+x=6$ $\quad 1+y=-22$

$x=9$ $\quad y=-23$

A. (0, −10) B. (6, -6) C. (0, -5) D. (9, -23)

Visually



24. A triangle has vertices at $A(1, 2)$, $B(2, 5)$, and C(8, 3). Classify the triangle by its sides and by its angles.

A. Acute scalene

B. Right scalene

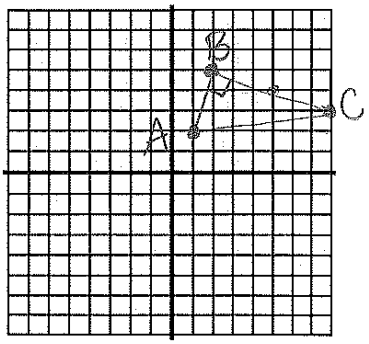
C. Right isosceles

D. Acute equilateral

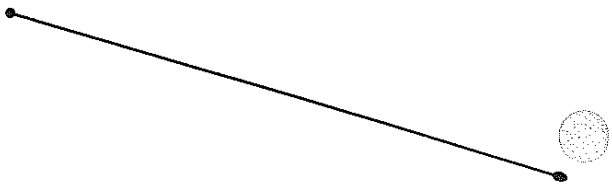
Slope $\overline{AB} = 3$

Slope $\overline{BC} = -\frac{1}{3}$

$\therefore \perp$

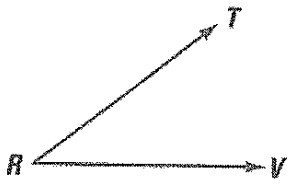


25. Use a ruler to find the length of the segment.



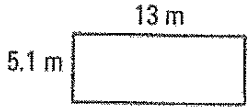
A. 3.1 cm B. 7.5 cm C. 7.8 cm D. 8 cm

26. Use a protractor for find the measure of $\angle VRT$?



A. 39° B. 41° C. 139° D. 141°

27. What is the perimeter of the rectangle?



26
+10.2

A. 18.1 m B. 36.2 m

C. 64 m D. 66.3 m

28. M is the midpoint of the segment. What is the length of the segment?

$x+7=2x-2$

$9=x$

$9+7=16$

16 16

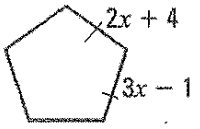
A. 9 B. 10

C. 16 D. 32

29. If the figure is a regular pentagon, find the value of x.

$2x+4=3x-1$

$5=x$



A. 5 B. 14

C. 25 D. 70

30. What property of real numbers is demonstrated by the statement?

"If $x = 20$, then $x + y = 20 + y$."

A. Transitive Property of Equality B. Substitution Property of Equality

C. Reflexive Property of Equality D. Addition Property of Equality

31. What property of real numbers is demonstrated by the statement?

"If $a = 20$, then $20 = a$."

A. Transitive Property of Equality
B. Substitution Property of Equality
C. Reflexive Property of Equality
D. Symmetry Property of Equality

32. What property of real numbers is demonstrated by the statement?

"If $3(x - 8) = 6$, then $3x - 24 = 6$"

A. Transitive Property
B. Distributive Property
C. Reflexive Property
D. Identity Property

33. What property of real numbers is demonstrated by the statement?

"If $x = 7$ and $y = -10 + x$, then $y = -3$."

A. Transitive Property of Equality
B. Substitution Property of Equality
C. Reflexive Property of Equality
D. Symmetry Property of Equality

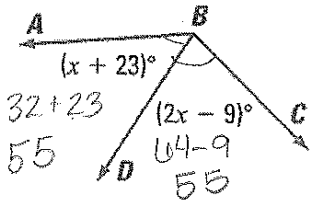
34. What property of real numbers is demonstrated by the statement?

"If $AB = CD$ and $CD = FG$, then $AB = FG$."

A. Transitive Property of Equality
B. Substitution Property of Equality
C. Reflexive Property of Equality
D. Symmetry Property of Equality

Free Form. Show your work and circle the answer.

34. In the diagram, $\overrightarrow{BD}$ bisects $\angle ABC$. What is the measure of $\angle ABC$?



32+23
55

4-9
55

X + 23 = 2X - 9
32 = X

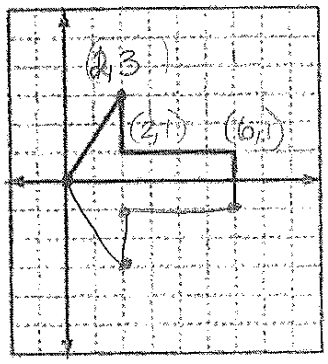
55(2) = 110°

35. Mr. T said, "If two angles are vertical angles, then they are congruent. Since $\angle A$ and $\angle B$ are congruent, they are vertical angles." Describe Mr. T's error and correct the error.

may be

→ ≅ ∠'s do not have to be VA

36. The design for a road sign shows the layout for only half of the sign.



a. What type of transformation can a designer use to create plans for the entire sign?

Reflection over $y=0$

b. Describe the transformation as accurately as possible.

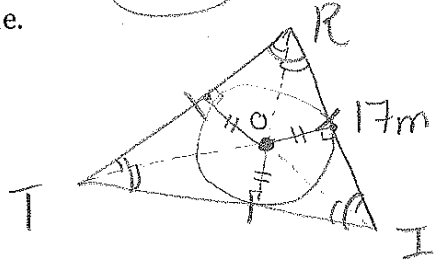
$(0,0) \to (0,0)$ $(2,1) \to (2,-1)$ Reflection over x axis → $(x,-y)$

$(2,3) \to (2,-3)$ $(6,1) \to (6,-1)$

c. Complete the transformation you described above.

37. Sketch, mark, and label regular triangle *TRI* with perimeter 51 m with incenter *O* and its inscribed circle.

≅ sides, ∠s



$\frac{51}{3} = 17$

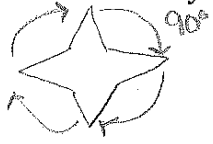
38. Give a counterexample of..."Triangles have right angles."

picture

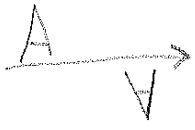
39. Sketch a figure that has...

a. Two lines of symmetry

b. 90° rotational symmetry



c. Glide reflection



40. In $\overline{XY}$, $X(0,5)$ and $Y(8,-1)$. Graph $\overline{XY}$, $\overline{X'Y'}$, $\overline{X''Y''}$, $\overline{X'''Y'''}$, and $\overline{X''''Y''''}$.

1st...Translation (slide): $\langle -6,-7 \rangle$

$X'(-6,-2)$ $Y'(2,-8)$

2nd...Dilation about the origin: $(x,y) \rightarrow (\frac{1}{2}x, \frac{1}{2}y)$

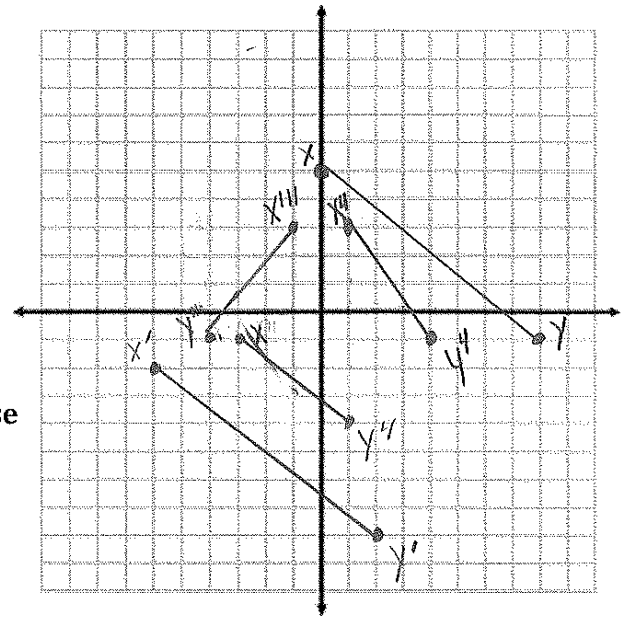
$X''(-3,-1)$ $Y''(1,-4)$

3rd...Rotation about the origin: 270° counter-clockwise

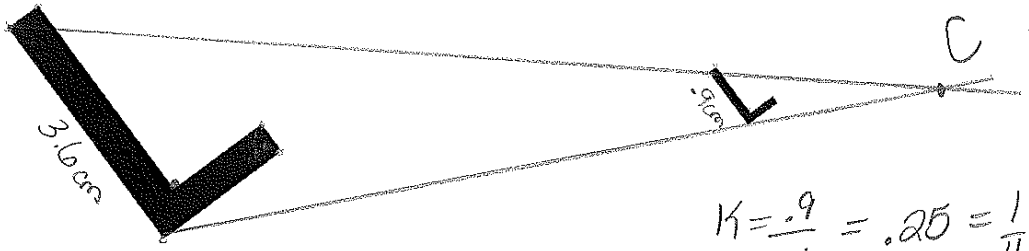
$X'''(-1,3)$ $Y'''(-4,-1)$ $(y,-x)$

4th...Reflection over $x = 0$ y-axis

$X''''(1,3)$ $Y''''(-4,-1)$



41. Find the scale factor and the center of the contraction dilation of tilted **L**s.



$k = \frac{.9}{3.6} = .25 = \frac{1}{4}$

42. Chue is running around the green space of a triangular park. While running, he starts thinking about geometry class. He wonders where circumcenter and the centroid points would be located. Use the gridded map of the park to locate the circumcenter (C) and centroid (T).

intersection of ⊥ bisectors

intersection of medians