Name Key Date _____ Period _____

3rd Quarter Review

1. Write the equation of a line that is parallel to $y = \frac{5}{2}x - 1$ that passes through (2, 3).

$y - 3 = \frac{5}{2}(x - 2)$

$y - 3 = \frac{5}{2}x - 5$

$+3 \quad +3$

$y = \frac{5}{2}x - 2$

2. Write the equation of a line that is perpendicular to $-5x + 2y = 10$ that passes through (5, -1).

$-5x + 2y = 10$

$+5x \quad +5x$

$2y = 5x + 10$

$y = \frac{5}{2}x + 5$

$y - (-1) = -\frac{2}{5}(x - 5)$

$y + 1 = -\frac{2}{5}x + 2$

$-1 \quad -1$

$y = -\frac{2}{5}x + 1$

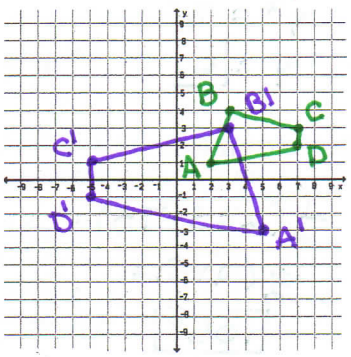
3. Given A(2, 1), B(3, 4), C(7, 3), and D(7, 2), find the image resulting from the transformation $(x, y) \rightarrow (-2x + 9, 2y - 5)$. Draw the preimage and image.

A' = (5, -3)

B' = (3, 3)

C' = (-5, 1)

D' = (-5, -1)



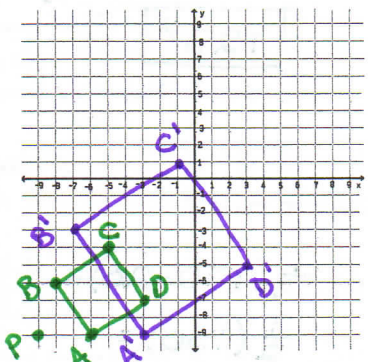
4. Draw the preimage and image of a figure with the vertices A(-6,-9), B(-8,-6), C(-5,-4), and D(-3,-7) under a dilation with a scale factor of 2 and a center of dilation of P(-9, -9). List the coordinates of the image.

A' = (-3, -9)

B' = (-7, -3)

C' = (-1, 1)

D' = (3, -5)



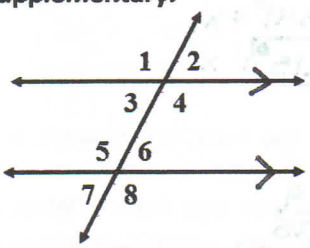
5. Give a counterexample for this conditional statement: If a number has an absolute value of 5, then the number is 5.

-5

6. Give a counterexample for this conditional statement: If a fraction can be reduced, then its numerator and denominator are even.

$\frac{9}{27}$ (any $\frac{\text{odd}}{\text{odd}}$ example that can be reduced)

Name the given angle pairs, and state if they are congruent or supplementary.



7. Angles 1 and 2 linear pair = 180°

8. Angles 1 and 4 vertical pair ≅

9. Angles 1 and 5 corresponding ∠s ≅

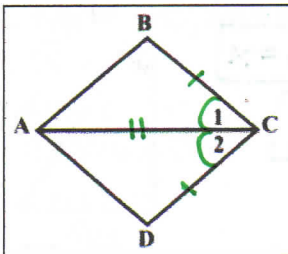
10. Angles 1 and 8 alternate exterior ∠s ≅

11. Angles 1 and 7 same side exterior ∠s = 180°

12. Angles 3 and 5 same side interior ∠s = 180°

13. Angles 3 and 6 alternate interior ∠s ≅

14. Fill in the triangle congruency reason for number 4.



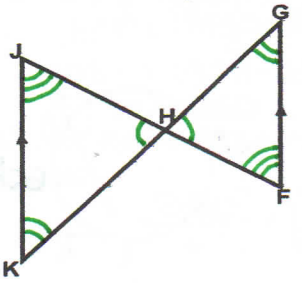
Given: $\overline{BC} \cong \overline{CD}$

$\overline{AC}$ bisects $\angle BCD$

Prove: $\Delta ABC \cong \Delta ADC$

Statements	Reasons
1. $\overline{BC} \cong \overline{CD}$	1. Given
2. $\angle 1 \cong \angle 2$	2. An angle bisector is a ray whose endpoint is the vertex of the angle and divides the angle into two congruent angles.
3. $\overline{AC} \cong \overline{AC}$	3. Reflexive Property (a quantity is congruent to itself)
4. $\Delta ABC \cong \Delta ADC$	SAS

15. Can these triangles be proven similar by AA? If so, write a similarity statement.



(YES) or NO

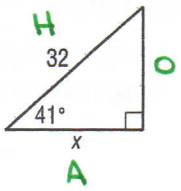
$\Delta HJK \sim \Delta HFG$

16. Determine the measure of side x to the nearest hundredth.

$\cos 41° = \frac{x}{32}$

$32\cos 41° = x$

$24.15 = x$

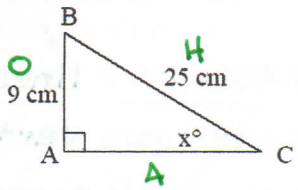


17. Determine the measure of angle x to the nearest tenth.

$\sin x° = \frac{9}{25}$

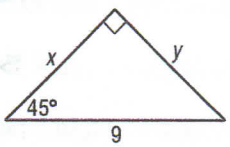
$x° = \sin^{-1}\left(\frac{9}{25}\right)$

$x° = 21.1°$



18. Find the length of x and y. Express your answer in radical form.

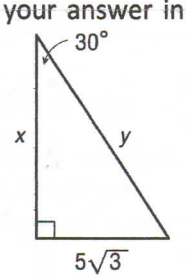
$\frac{x\sqrt{2}}{\sqrt{2}} = \frac{9}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{9\sqrt{2}}{2}$



19. Find the length of x and y. Express your answer in radical form.

$5\sqrt{3} \cdot \sqrt{3} = 5 \cdot 3 = 15 = x$

$2(5\sqrt{3}) = 10\sqrt{3} = y$

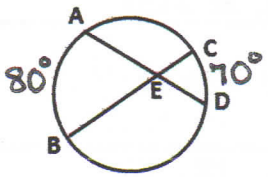


20. Find m∠AEB.

$\frac{1}{2}(80+70) =$

$\frac{1}{2}(150) =$

$75°$

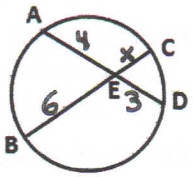


21. Find x.

$4 \cdot 3 = 6x$

$12 = 6x$

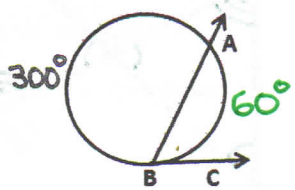
$2 = x$



22. Find m∠ABC.

$\frac{1}{2}(60) =$

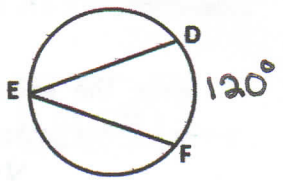
$30°$



23. Find m∠DEF.

$\frac{1}{2}(120) =$

$60°$

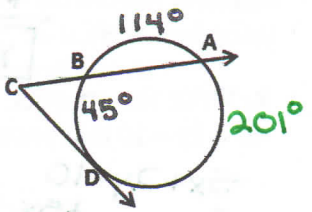


24. Find m∠ACD.

$\frac{1}{2}(201-45) =$

$\frac{1}{2}(156) =$

$78°$



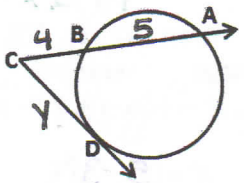
25. Find y.

$y^2 = 4(4+5)$

$y^2 = 4(9)$

$y^2 = 36$

$y = 6$

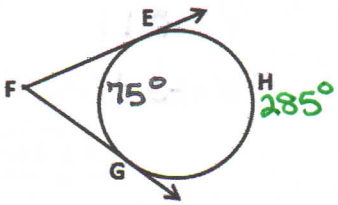


26. Find m∠EFG.

$\frac{1}{2}(285-75) =$

$\frac{1}{2}(210) =$

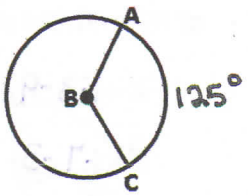
$105°$



27. Find m∠ABC.

central angle

$125°$

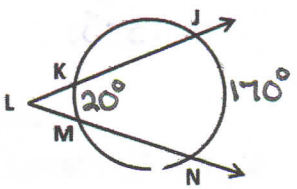


28. Find m∠JLN.

$\frac{1}{2}(170-20) =$

$\frac{1}{2}(150) =$

$75°$



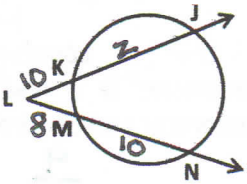
29. Find z.

$8(8+10) = 10(10+z)$

$144 = 100 + 10z$

$44 = 10z$

$4.4 = z$



30. Fill in the blanks: Radian measure is the ratio of the length of an arc intercepted by a central angle and the radius of the circle.

31. An angle has a measure of $\frac{2\pi}{7}$ radians. A classmate says that a reasonable estimate for the degree measure of the angle is 103°. Do you agree? Explain.

$\frac{2\pi}{7} \cdot \frac{180}{\pi} = \frac{360}{7} = 51.4°$ no

32. Find the radian measure of an angle of 300°.

$\frac{300^\circ}{1} \cdot \frac{\pi}{180^\circ} = \frac{5\pi}{3}$ radians

33. What is the equation of a circle with center at the origin and radius r?

$x^2 + y^2 = r^2$

34. Write the equation for a circle with center (-1, 3) and radius 6.

$(x--1)^2+(y-3)^2=6^2$

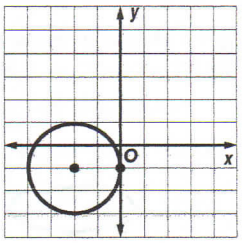
$(x+1)^2+(y-3)^2=36$

35. Write the equation for the circle below.

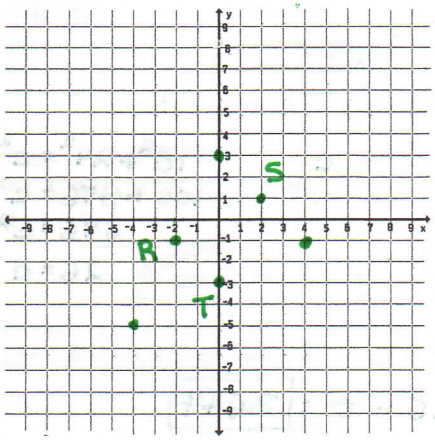
r=2 (-2,-1)

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

$(x+2)^2+(y+1)^2=4$



36. A parallelogram has vertices R(-2, -1), S(2, 1), and T(0, -3). Find all possible coordinates for the fourth vertex.



(4,-1)

(0,3)

(-4,-5)

37. Find the coordinates of the intersection of the diagonals of parallelogram HJKL with the vertices H(-1, 4), J(3, 3), K(3, -2), L(-1, -1).

M $\overline{HK} = \left(\frac{-1+3}{2}, \frac{4+-2}{2}\right) = (1, 1)$

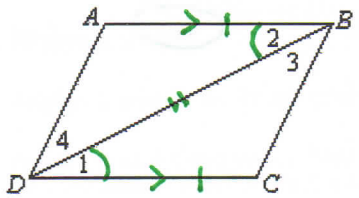
M $\overline{JL} = \left(\frac{3+-1}{2}, \frac{3+-1}{2}\right) = (1, 1)$

(1,1)

Prove that if one pair of opposite sides of a quadrilateral is both parallel and congruent, then the quadrilateral is a parallelogram. Answers for reasons 4, 5, and 7 will be questions 38, 39, 40, respectively.

Given: $\overline{AB} \parallel \overline{DC}$, $\overline{AB} \cong \overline{DC}$

Prove: *ABCD* is a parallelogram.



Proof:

Statement	Reason
1. $\overline{AB} \parallel \overline{DC}, \overline{AB} \cong \overline{DC}$	1. Given
2. $\overline{DB} \cong \overline{DB}$	2. Reflexive Property
3. $\angle 1 \cong \angle 2$	3. Alternate interior angles
4. $\triangle ABD \cong \triangle CDB$	4.
5. $\angle 3 \cong \angle 4$	5.
6. $\overline{AD} \parallel \overline{BC}$	6. $\angle A \cong \angle C$, $\angle B \cong \angle D$, lines are ||.
7. *ABCD* is a parallelogram.	7.

38. Reason #4 above:

SAS

39. Reason #5 above:

CPCTC

40. Reason #6 above:

definition of parallelogram

41. Find the number of sides of a regular polygon whose interior angles each measure 108°.

$108^\circ = \frac{180(n-2)}{n}$

$108n = 180n - 360$

$-72n = -360$

n = 5

42. Find the measure of each exterior angle of a regular hexagon.

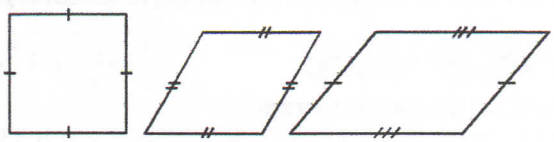
$\frac{360^\circ}{6} = 60^\circ$

43. Find the measure of each interior angle of a regular hexagon. $\frac{180(6-2)}{6} = \frac{180(4)}{6} = \frac{720}{6} = 120°$

44. Ishmael makes the following conjecture:

- The diagonals of a parallelogram intersect at right angles.

Which of the parallelograms in the figure ~~above~~ below! is a *counterexample* for Ishmael's conjecture?



45. Which of the following statements must be true?

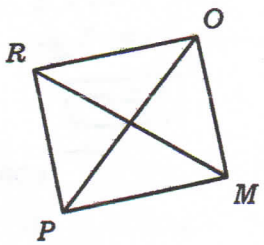
I. The diagonals of a parallelogram are congruent.

II. A diagonal divides a square into two isosceles right triangles.

III. A pair of base angles of an isosceles trapezoid are supplementary.

IV. If a quadrilateral has two congruent sides, then it has two congruent angles.

46.



Quadrilateral $PROM$ is a parallelogram with $\overline{MR} \perp \overline{PO}$ and $\angle ROP$ complementary to $\angle POM$.

Which of the following statements is true?

I. Quadrilateral $PROM$ is a rhombus

II. Quadrilateral $PROM$ is a square

III. Quadrilateral $PROM$ is a rectangle

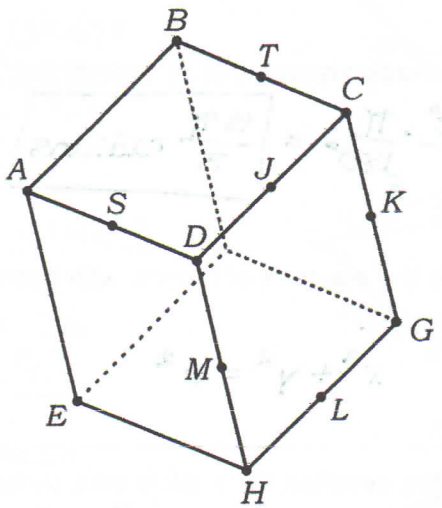
(also fine if all 3)

47. ABCD is a rhombus with diagonals intersecting at point P. If A(-1, 8) and P(2, 2), what are the coordinates of C?

+3	-1 | 8	-6
+3	2 | 2	-6
	5 | -4	

(5, -4)

48. Which three points on the cube below will determine a plane such that the intersection between the plane and the cube is an isosceles trapezoid? Assume all labels are for vertices or midpoints.



a) S, C, K

b) D, K, T

c) T, L, S

d) S, J, K

49. State the congruence relation for $\triangle FLE$ and $\triangle FUE$.

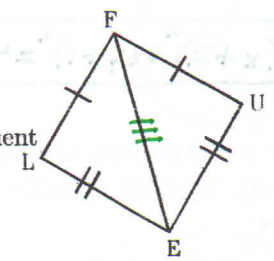
a) ASA

b) AAA

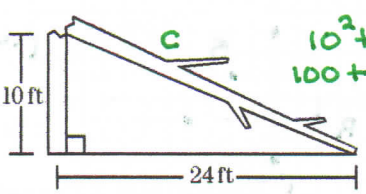
c) SSA

d) SSS

e) not necessarily congruent



50. A tree breaks and falls as shown.



$10^2 + 24^2 = c^2$
$100 + 576 = c^2$
$676 = c^2$
$26 = c$

What was the original height of the tree?

$26 + 10 =$ 36 ft