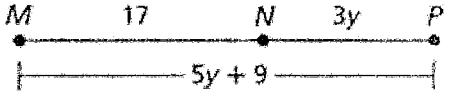
Mikey

Bryant – Geometry **Semester 1 Final Review**

Chapter 1: Tools of Geometry

1. Find MP.



$3y+17=5y+9$

$8=2y$

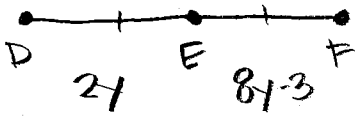
$y=4$

$MP=5y+9$

$=5(4)+9$

$MP=29$

2. E bisects $\overline{DF}$, $DE = 2y$, and $EF = 8y - 3$. Find DE, EF, and DF.



$2y=8y-3$

$3=6y$

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

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

$EF=8(\frac{1}{2})-3=1$

$DF=1+1=2$

3. E is the midpoint of $\overline{DF}$, $DE = 2x + 4$, and $EF = 3x - 1$. Find DE, EF, and DF.

$2x+4=3x-1$

$x=5$

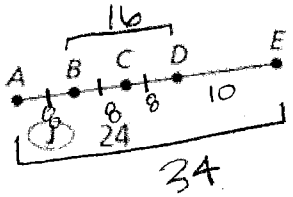
$DE=2(5)+4=14$

$EF=3(5)-1=14$

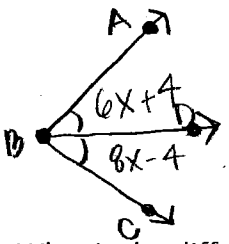
$DF=14+14=28$

4. A, B, C, D, and E are collinear points. $AE = 34$, $BD = 16$, and $AB = BC = CD$. What is the length of $\overline{CE}$?

Ⓕ 10 Ⓖ 16 ● 18



5. $\overrightarrow{BD}$ bisects $\angle ABC$. Find $m\angle ABD$ if $m\angle ABD = (6x + 4)°$ and $m\angle DBC = (8x - 4)°$.



$6x+4=8x-4$

$8=2x$

$x=4$

$m\angle ABD=6x+4$

$=6(4)+4$

$m\angle ABD=28°$

*Lots of vocab & notation required

6. What is the difference between a linear pair and supplementary angles?

2 angles that form a linear pair must be adjacent, whereas supp. $\angle$s do not have to be adjacent.

7. ∠A and ∠B are supplementary. The measure of ∠A is 18° less than the measure of ∠B. Find the measure of each angle.

$=180°$

$m\angle A + m\angle B = 180°$

$m\angle A = B - 18$

$(B-18)+B=180$

$2B=198 \longrightarrow B=99$

$m\angle A = 99-18 = 81°$

$m\angle B = 99°$

8. ∠A and ∠B are complementary. The measure of ∠B is 4 times the measure of ∠A. Find the measure of each angle.

$=90°$

$m\angle A + m\angle B = 90°$

$m\angle B = 4A$

$A+4A=90$

$5A=90$

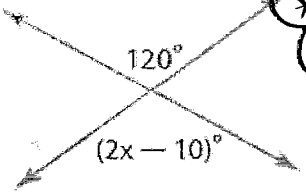
$A=18$

$m\angle A = 18°$

$m\angle B = 5 \cdot 18 = 72°$

Find the value of each variable in #9-12.

9.



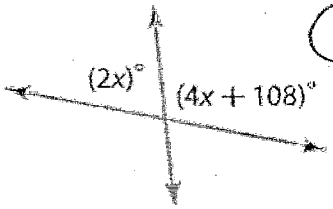
*Vertical angles

$2x-10=120$

$2x=130$

$x=65$

10.



*Linear pair

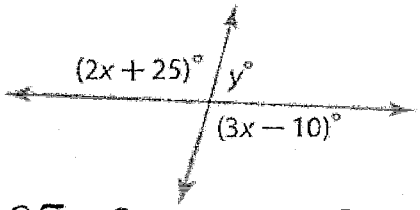
$2x+4x+108=180$

$6x+108=180$

$6x=72$

$x=12$

11.



$2x+25=3x-10$

$x=35$

$2x+25+y=180$

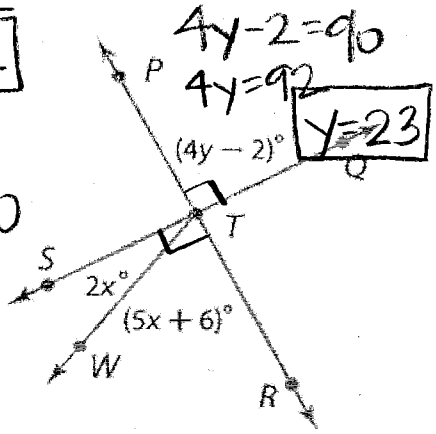
$2(35)+25+y=180$

$95+y=180$

$y=85$

12. ∠STR is a right angle

∠PTQ is a right angle



$2x+5x+6=90$

$7x=84$

$x=12$

$4y-2=90$

$4y=92$

$y=23$

13. Find (CD) C(−4, −6), D(5, −1)

length/distance

$+9, +5$

$d=\sqrt{(\text{rise})^2+(\text{run})^2}$

$=\sqrt{(5)^2+(9)^2}=\sqrt{25+81}=\sqrt{106}$

14. Find the midpoint of $\overline{CD}$. C(−4, −6), D(5, −1)

$\left(\frac{-4+5}{2}, \frac{-6+-1}{2}\right) = \left(\frac{1}{2}, \frac{-7}{2}\right)$

15. Find AB. A(2, −3), B(5, 6)

$+3$

$+9$

$d=\sqrt{(\text{rise})^2+(\text{run})^2}$

$=\sqrt{(9)^2+(3)^2}$

$=\sqrt{81+9}=\sqrt{90}$

16. Find the midpoint of $\overline{AB}$. A(2, −3), B(5, 6)

$\left(\frac{2+5}{2}, \frac{-3+6}{2}\right) = \left(\frac{7}{2}, \frac{3}{2}\right)$

Chapter 2

Identify the property:

17. If $AB = CD$, then $AB + BC = CD + BC$. Addition Property of equality

18. If $\angle X \cong \angle Y$ and $\angle Y \cong \angle Z$, then $\angle X \cong \angle Z$. Transitive property

19. If $\frac{x}{6} = 5$, then $x = 30$. Mult. Prop. of Equality

20. If $XY + CD = 30$ and $XY = 12$, then $12 + CD = 30$. Substitution Property

21. If $88 = 2x$, then $44 = x$. Division property of equality

22. If $x + 32 = 18$, then $x = -14$. Subtraction property of equality

23. If the Chiefs beat the Raiders and the Raiders beat the Broncos, then the Chiefs should beat the Broncos.

Transitive property

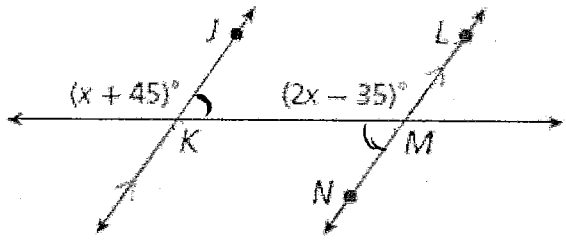
Chapter 3A

24. What type of angle pair are ∠JKM and ∠KMN?

Alternate interior angles

25. What type of angle pair are ∠JKM and ∠LMK?

Same side interior angles



26. What is m∠KML?

$2x - 35 = x + 45$

$x = 80$

$m\angle KML = 2x - 35$
$= 2(80) - 35$
$= 125°$

Solve the following systems of equations.

27. $-4x - 6y = 2$
$4(x + 2y = 0)$

$-4x - 6y = 2$
$+ \; 4x + 8y = 0$
$2y = 2$
$y = 1$

$x + 2(1) = 0$
$x = -2$

$(-2, 1)$

28. $2 \cdot (-7x - 2y = -12)$
$14x + 7y = 21$

$-14x - 4y = -24$
$14x + 7y = 21$
$3y = -3$
$y = -1$

$14x + 7(-1) = 21$
$14x = 28$
$x = 2$

$(2, -1)$

Chapter 3B

29. Are the graphs of the following equations parallel, perpendicular, or oblique? EXPLAIN WHY!

a) $y = \frac{1}{2}x - 3$ Oblique: Slopes ≠ & slopes not opp.
$y = -\frac{1}{2}x + \frac{1}{3}$

b) $y = 2x - 4$ Parallel
$y = 2x + 14$ Same slope

c) $y = -\frac{2}{3}x - 2$ perpendicular
$y = \frac{3}{2}x + 100$ Slopes are opp. reciprocals

d) $3x - y = -12$ $y = 3x + 12$ Oblique
$2y - 4x = 9$ $y = 2x + \frac{9}{2}$ see #29a

30. Write an equation of the line that passes through (1, 2) and is parallel to $y = \frac{3}{4}x - 8$.

$m = \frac{3}{4}$ $y - 2 = \frac{3}{4}(x - 1)$

$y = \frac{3}{4}x - \frac{3}{4} + \frac{8}{4}$

$y = \frac{3}{4}x + \frac{5}{4}$

31. Write an equation of the line that passes through (7, 4) and is perpendicular to $y = -\frac{2}{3}x + 97$.

$m = \frac{3}{2}$ $y - 4 = \frac{3}{2}(x - 7)$

$y = \frac{3}{2}x - \frac{21}{2} + \frac{8}{2}$

$y = \frac{3}{2}x - \frac{13}{2}$

32. Write an equation of the line that passes through the points (5, -3) and (-2, 3).

$m = -\frac{6}{7}$ $y - 3 = -\frac{6}{7}(x + 2)$

$y = -\frac{6}{7}x - \frac{12}{7} + \frac{21}{7}$

$y = -\frac{6}{7}x + \frac{9}{7}$

33. Find the slope of $\overline{AB}$. A(-3, -2) B(2, -5)

$m = -\frac{3}{5}$

34. Find the slope of $\overline{AB}$ A(5, -6) B(5, -3)

$m = \frac{3}{0}$ ← can't have!! undefined slope

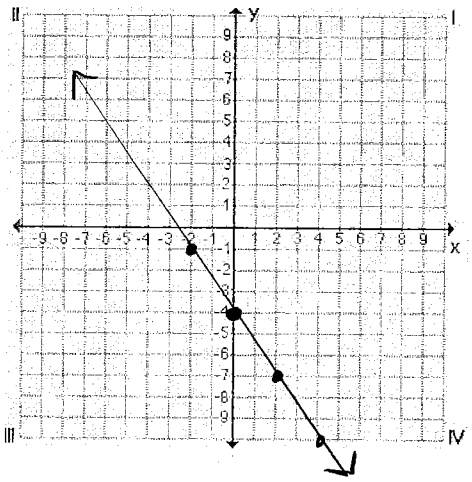
35. Find the slope of $\overline{AB}$ A(-2, 3) B(5, 3)

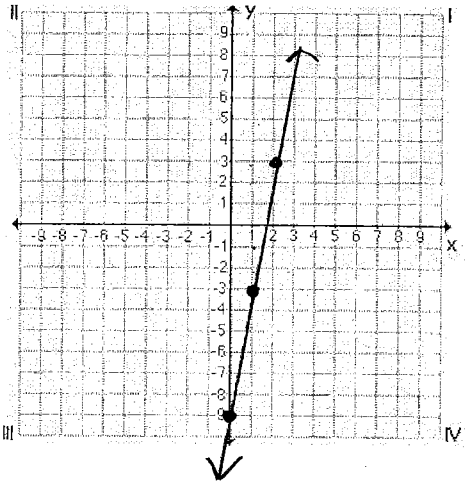
$m = \frac{0}{7} = 0$ slope

36. Graph the following lines.

a) $-3x - 2y = 8$ $y = -\frac{3}{2}x - 4$

b) $4x - \frac{2}{3}y = 6$ $\frac{3}{2} \cdot \frac{2}{3}y = 4x - 6 \cdot \frac{3}{2}$ $y = 6x - 9$



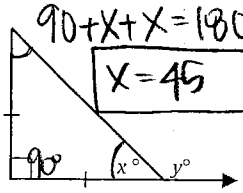


Chapter 4A: Triangles

Directions: Find the missing variables in 37-44 below.

37. $90 + X + X = 180$

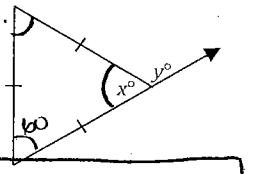
$X = 45$ $y = 135$



$X + Y = 180$

$Y = 180 - 45$

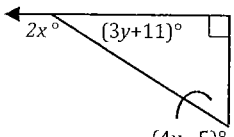
38.



$X = 60$ $y = 120$

$Y = 180 - 60$

39.



$2X + 3Y + 11 = 180$

$2X + 3(12) + 11 = 180$

$2X + 36 + 11 = 180$

$2X = 133$

$3Y + 11 + 4Y - 5 = 90$

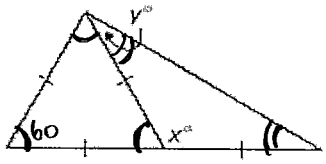
$7Y + 6 = 90$

$7Y = 84$

$Y = 12$

$X = 66\frac{1}{2}$

40.



$X = 180 - 60$

$X = 120$

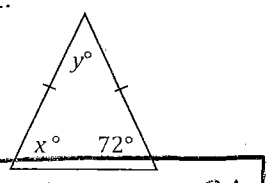
$Y = 30$

$180 = X + Y + Y$

$180 = 120 + 2Y$

$60 = 2Y$

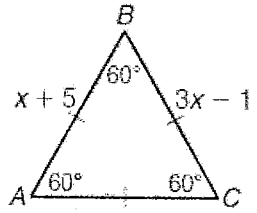
41.



$X = 72$ $Y = 36$

$Y = 180 - (72 \cdot 2)$

42.

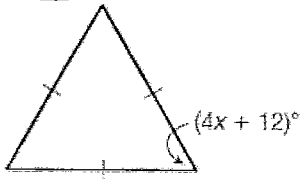


$X + 5 = 3X - 1$

$2X = 6$

$X = 3$

43.

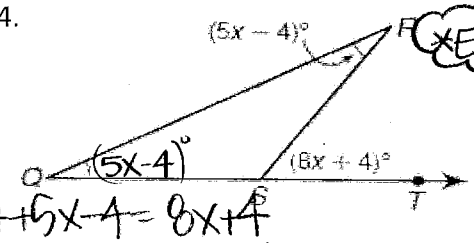


$4X + 12 = 60$

$4X = 48$

$X = 12$

44.



X Exterior ∠s Thm

$5X - 4 + 5X - 4 = 8X + 4$

$10X - 8 = 8X + 4$

$2X = 12$

$X = 6$

45. Determine whether the following side lengths could form a triangle.

a. 8, 8, 16

$8+8=16 \not> 16$

No

b. 0.5, 0.7, 0.3

$0.5+0.3=0.8>0.7$ ✓

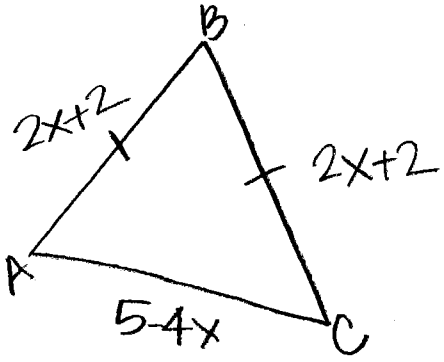
Yes

c. 10.5, 4, 14

$10.5+4=14.5>14$ ✓

Yes

46. In $\Delta ABC, AB = BC$. If $AB = 2x + 2$ and $AC = 5 - 4x$. What would the perimeter of the triangle be?



$2x+2+2x+2+5-4x=P$

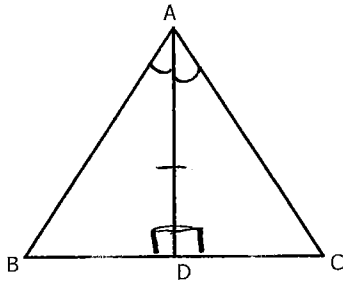
$0x+9=P$

The perimeter is 9

Chapter 4B: Triangle Proofs

47. **Given:** $\overline{AD}$ bisects $\angle BAC$, $\overline{AD} \perp \overline{BC}$

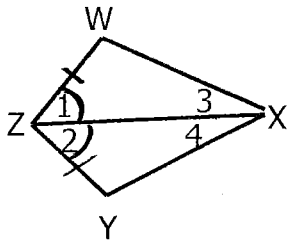
Prove: $\Delta ABD \cong \Delta ACD$



Statements	Reasons
1. $\overline{AD}$ bisects $\angle BAC$	1. Given
2. $\angle BAD \cong \angle CAD$	2. Def. of bisect
3. $\overline{AD} \perp \overline{BC}$	3. Given
4. $\angle BDA$ & $\angle CDA$ are rt. $\angle$s	4. Def. of $\perp$
5. $\angle BDA \cong \angle CDA$	5. all rt. $\angle$'s $\cong$
6. $AD \cong AD$	6. reflexive
7. $\Delta ABD \cong ACD$	7. ASA

48. **Given:** $\overline{WZ} \cong \overline{YZ}$, $\angle 1 \cong \angle 2$

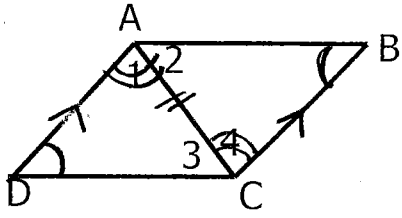
Prove: $\angle 3 \cong \angle 4$ — Trying to prove parts ≅, So CPCTC!!



Statements	Reasons
1. $\overline{WZ} \cong \overline{YZ}$	1. Given
2. $\angle 1 \cong \angle 2$	2. Given
3. $\overline{ZX} = \overline{ZX}$	3. Reflexive property
4. $\triangle ZWX \cong \triangle ZYX$	4. SAS
5. $\angle 3 \cong \angle 4$	5. CPCTC

49. **Given:** $\overline{AD} \parallel \overline{BC}$, $\angle B \cong \angle D$

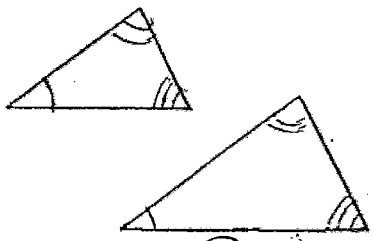
Prove: $\triangle ACD \cong \triangle CAB$



Statements	Reasons
1. $\overline{AD} \parallel \overline{BC}$	1. Given
2. $\angle 1 \cong \angle 4$	2. Alt. Interior Ls Thm.
3. $\angle B \cong \angle D$	3. Given
4. $\overline{AC} \cong \overline{AC}$	4. Reflexive Property
5. $\triangle ACD \cong \triangle CAB$	5. AAS

Can you prove these triangles are congruent? If yes, state the postulate, if no, explain why not.

50.

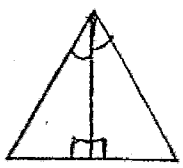


Congruent: yes (no)

If yes, Postulate:_____

If no, Explain: You can't prove $\triangle \cong$ with only 3 Ls. You need @ least 1 side.

51.

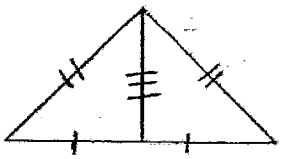


Congruent: (yes) no

If yes, Postulate: ASA

If no, Explain:

52.



Congruent: (yes) no

If yes, Postulate: SSS

If no, Explain:

53.

Congruent: yes (no)

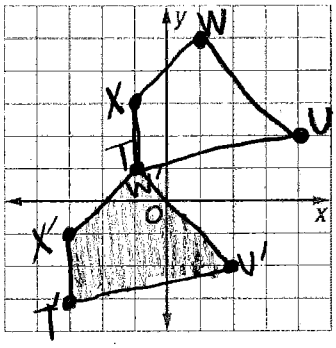
If yes, Postulate: _____

If no, Explain: We only know 2 pairs of ≅ parts.

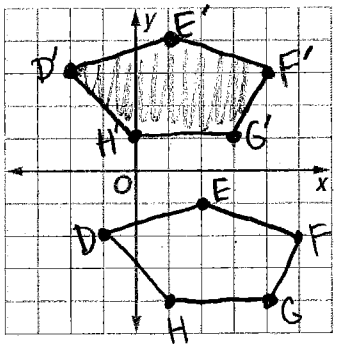
Chapter 9: Transformations

Directions: Graph each figure and its image along the given vector.

54. quadrilateral *TUWX* with vertices *T*(–1, 1), *U*(4, 2), *W*(1, 5), and *X*(–1, 3); ⟨–2, –4⟩



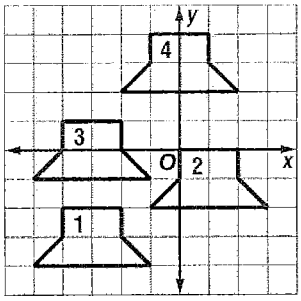
55. pentagon *DEFGH* with vertices *D*(–1, –2), *E*(2, –1), *F*(5, –2), *G*(4, –4), and *H*(1, –4); ⟨–1, 5⟩



Directions : Given the figure, write the translation vector from:

56. figure 1 → figure 2

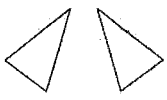
⟨4, 2⟩



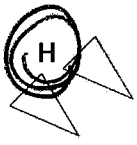
57. figure 3 → figure 4

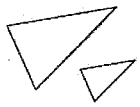
⟨3, 3⟩

58. Which of the following figures shows a translation?

F 

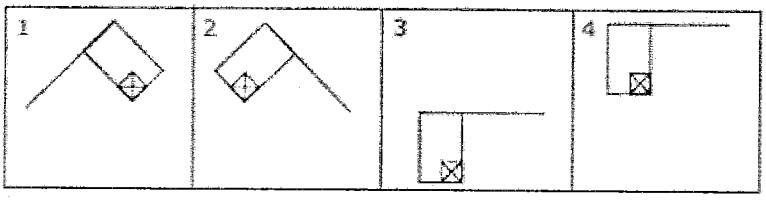
G 

(H) 

J 

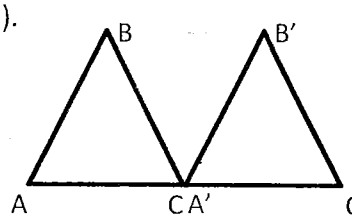
59. Which of the following best describes the movement of the flag from picture to picture? (G.5C)

A. Reflection, rotation, translation
B. Rotation, translation, translation
C. Rotation, translation, dilation
D. Reflection, translation, translation



60. Directions: Identify the type of rigid transformation being displayed (reflection, translation, or rotation).

a).  reflection

b). 

translation

Semester 1 Vocabulary

point	line	plane	collinear
coplanar	segment	endpoint	ray
opposite rays	postulate	theorem	midpoint
bisector	angle	vertex	acute angle
obtuse angle	right angle	straight angle	adjacent angles
linear pair	supplementary	complementary	vertical angles
hypotenuse	biconditional	parallel lines	perpendicular lines
skew lines	oblique lines	transversal	scalene
isosceles	equilateral	equiangular	corresponding angles
slope	CPCTC	mid-segment	alternate interior angles
congruent	rotation	translation	alternate exterior angles
leg	reflection	consecutive interior angles	

Foundations of Geometry

Be able to draw and label:

Line
Plane
Segment
Ray
Opposite rays
Angle – acute, obtuse or right
Collinear points

Formulas

Know, and be able to use, the following formulas:

Distance
Midpoint
Slope

Theorems, Postulates, and Properties

Know the following properties:

Properties of Equality

Addition Property of Equality	If $a = b$, then $a + c = b + c$.
Subtraction Property of Equality	If $a = b$, then $a - c = b - c$.
Multiplication Property of Equality	If $a = b$, then $ac = bc$.
Division Property of Equality	If $a = b$ and $c \neq 0$, then $\frac{a}{c} = \frac{b}{c}$.
Reflexive Property of Equality	$a = a$
Symmetric Property of Equality	If $a = b$, then $b = a$.
Transitive Property of Equality	If $a = b$ and $b = c$, then $a = c$.
Substitution Property of Equality	If $a = b$, then b can be substituted for a in any expression.

Know the following postulates:

Angle Addition Postulate

Segment Addition Postulate

Know the following theorems:

Triangle Sum Theorem

Exterior Angle Theorem

Know the following postulates/theorems for proving triangles congruent:

SSS

SAS

ASA

AAS

HL

Do NOT work: SSA, AAA