Constructed Response.

13. Factor.
$6x^3 + 9x^2 - 12xy$

$3x(2x^2 + 3x - 4y)$

14. Factor out the greatest common factor.

$4a^4b - 6a^2b^2 + 12a^3b$

$2a^2b(2a^2 - 3b + 6a)$

15. Factor out the greatest common factor.

$5ab^2 + 10ab$

$5ab(b+2)$

18. Write in factored form. $6y^2 - y - 2$

$6(-2) = -12$
$-4 \quad 3$

$(3y-2)(2y+1)$

19. What are the factors of $x^2 + 9x + 20$?

A M

$(x+5)(x+4)$

20. Factor. $8b^2 - 10b + 3$

$8 \cdot 3 = 24$
$-6 \quad -4$

$8b^2 - 4b - 6b + 3$
$4b(2b-1) - 3(2b-1)$
$(4b-3)(2b-1)$

15) $-4x - 15y = -17$
$-x + 5y = -13$

$x = 8$
$y = -1$
$(8, -1)$

16) $-x - 7y = 14$
$-4x - 14y = 28$

$(0, -2)$

17) $-7x - 8y = 9$
$-4x + 9y = -22$

$(1, -2)$

18) $5x + 4y = -30$
$3x - 9y = -18$

$(-6, 0)$

19) $-4x - 2y = 14$
$-10x + 7y = -25$

$(-1, -5)$

20) $3x - 2y = 2$
$5x - 5y = 10$

$(-2, -4)$

21) $5x+4y=-14$
$3x+6y=6$

(-6, 4)

22) $2x+8y=6$
$-5x-20y=-15$

infinite # of solutions

23) $-14=-20y-7x$
$10y+4=2x$

(2, 0)

24) $3+2x-y=0$
$-3-7y=10x$

(-1, 1)

11) $x+3y=1$
$-3x-3y=-15$

(7, -2)

12) $-3x-8y=20$
$-5x+y=19$

(-4, -1)

13) $-3x+3y=4$
$-x+y=3$

No solution

14) $-3x+3y=3$
$-5x+y=13$

(-3, -2)

15) $6x+6y=-6$
$5x+y=-13$

(-3, 2)

16) $2x+y=20$
$6x-5y=12$

(7, 6)

17) $-3x-4y=2$
$3x+3y=-3$

(-2, 1)

18) $-2x+6y=6$
$-7x+8y=-5$

(3, 2)

19) $-5x-8y=17$
$2x-7y=-17$

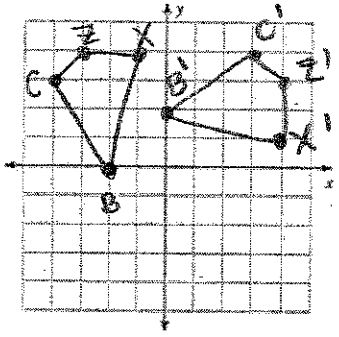
(-5, 1)

20) $-2x-y=-9$
$5x-2y=18$

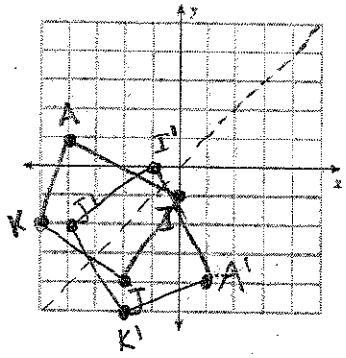
(4, 1)

Graph the image of the figure using the transformation given.

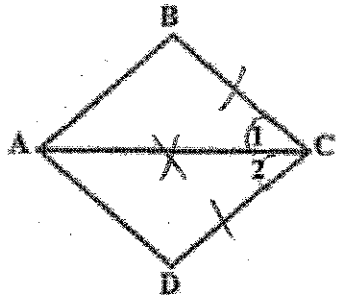
9) rotation 90° clockwise about the origin
$B(-2, 0)$, $C(-4, 3)$, $Z(-3, 4)$, $X(-1, 4)$



10) reflection across $y = x$
$K(-5, -2)$, $A(-4, 1)$, $I(0, -1)$, $J(-2, -4)$



1.



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

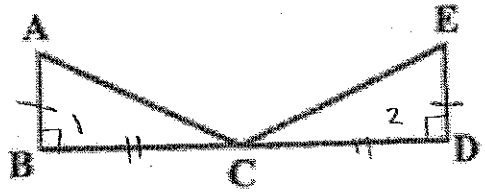
$\overline{AC}$ bisects $\angle BCD$

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

Proof

S	R
(1) $\overline{BC} \cong \overline{CD}$, $\overline{AC}$ bisects $\angle BCD$	(1) given
(2) $\angle 1 \cong \angle 2$	(2) def of bisect
(3) $\overline{AC} \cong \overline{AC}$	(3) Reflexive POE
(4) $\Delta ABC \cong \Delta ADC$	(4) SAS

2.



Given: $\overline{AB} \cong \overline{ED}$

C is midpoint $\overline{BD}$

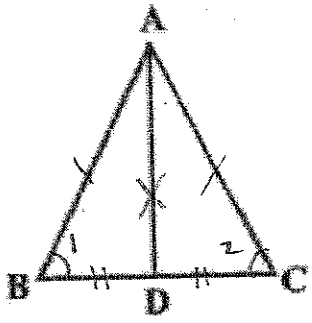
$\overline{AB} \perp \overline{BD}$; $\overline{ED} \perp \overline{BD}$

Prove: $\Delta ABC \cong \Delta EDC$

Proof

S	R
① $\overline{AB} \cong \overline{ED}$, C is the midpoint of BD	① given
② $\overline{BC} \cong CD$	② def of midpoint
③ $\overline{AB} \perp \overline{BD}$, $\overline{FD} \perp \overline{ED}$	③ given
④ $\angle 1$ and $\angle 2$ are right $\angle$s	④ def of $\perp$
⑤ $\angle 1 \cong \angle 2$	⑤ all right $\angle$s are $\cong$
⑥ $\Delta ABC \cong \Delta EDC$	⑥ SAS

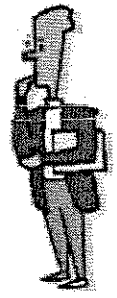
3.



Given: $\overline{AB} \cong \overline{AC}$

$\overline{AD}$ bisects $\overline{BC}$

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



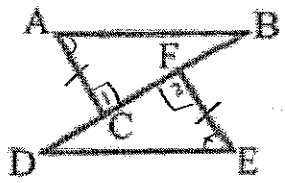
Proof

S	R
① $\overline{AB} \cong \overline{AC}$, $\overline{AD}$ bisects BC	① given
② $\overline{BD} \cong \overline{DC}$	② def of bisect
③ $\overline{AD} \cong \overline{AD}$	③ Reflexive POE
④ $\Delta ABD \cong \Delta ACD$	④ SSS

OR

S	R
① $\overline{AB} \cong AC$, AD bisects BC	① given
② $BD \cong DC$	② def of bisect
③ $\angle 1 \cong \angle 2$	③ ITT
④ $\Delta ABD \cong \Delta ACD$	④ SAS

4.



Given: $\overline{AC} \perp \overline{DB}$; $\overline{EF} \perp \overline{DB}$

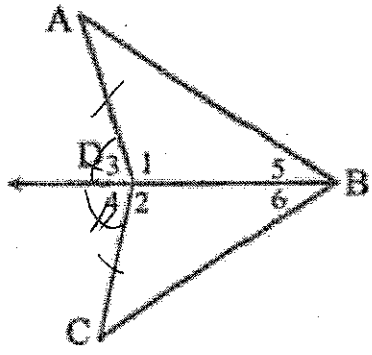
$\overline{AC} \cong \overline{EF}$; $\angle A \cong \angle E$

Prove: $\angle B \cong \angle D$

Proof

S	R
(1) $\overline{AC} \perp \overline{DB}$, $\overline{EF} \perp \overline{DB}$ $\overline{AC} \cong \overline{EF}$, $\angle A \cong \angle E$	(1) given
(2) $\angle 1$ and $\angle 2$ are right $\not\angle$s	(2) def of $\perp$
(3) $\angle 1 \cong \angle 2$	(3) all right $\not\angle$s are $\cong$
(4) $\triangle ABC \cong \triangle EDF$	(4) ASA
(5) $\angle B \cong \angle D$	(5) CPCTC

5.



Given: $\overline{BD}$

$\overline{AD} \cong \overline{CD}$

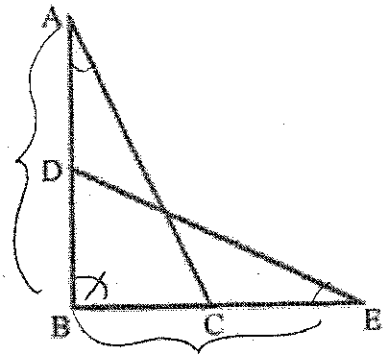
$\angle 3 \cong \angle 4$

Prove: $\overline{DB}$ bisects $\angle ABC$

Proof

S	R
1) $\overline{AD} \cong \overline{CD}$, $\angle 3 \cong \angle 4$	(1) given
2) $\angle 1$ and $\angle 3$ form a linear pair, $\angle 2$ and $\angle 4$ form a linear pair	(2) def. of Linear pair
3) $\angle 1$ is supp $\angle 3$, $\angle 2$ is supp $\angle 4$	(3) Linear pair Theorem
4) $\angle 1 \cong \angle 2$	(4) supplements of
(5) $\overline{DB} \cong \overline{DB}$	(5) Reflexive Po
(6) $\triangle ADB \cong \triangle CDB$	(6) SAS
(7) $\angle 5 \cong \angle 6$	(7) CPCTC
(8) $\angle 5 + \angle 6 = \angle ABC$	(8) $\not\angle$ addition
(9) $\overline{DB}$ bisects $\not\angle ABC$	(9) Def. of $\not\angle$ bise

6.



Given: $\measuredangle A \cong \measuredangle E$

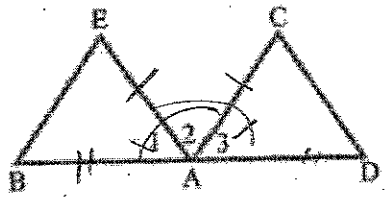
$\overline{AB} \cong \overline{BE}$

Prove: $\overline{AD} \cong \overline{EC}$

Proof

S	R
1) $\angle A \cong \angle E$, $\overline{AB} \cong \overline{BE}$	1) given
2) $\angle B \cong \angle B$	2) Reflexive POE
3) $\triangle ABC \cong \triangle EBD$	3) ASA
4) $\overline{DB} \cong \overline{CB}$	4) CPCTC
5) $\overline{AD} + \overline{DB} = \overline{AB}$, $\overline{EC} + \overline{CB} = \overline{BE}$	4) segment addtn.
6) $\overline{AD} \cong \overline{EC}$	6) when $\cong$ segments are added to $\cong$ segments, the sums are $\cong$

7.



Given: $\measuredangle BAC \cong \measuredangle DAE$

$\overline{AE} \cong \overline{AC}$

A is midpoint $\overline{BD}$

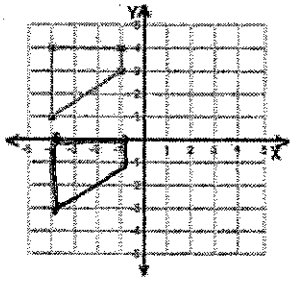
Prove: $\Delta BEA \cong \Delta DCA$

Proof

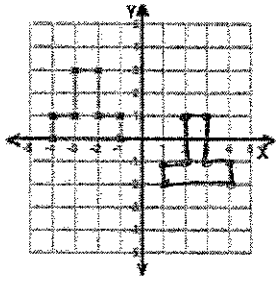
S	R
1) $\angle BAC \cong \angle DAE$, $\overline{AE} \cong \overline{AC}$, A is midpt $\overline{BD}$	1) given
2) $\angle 1 + \angle 2 = \angle BAC$, $\angle 2 + \angle 3 = \angle DAE$	2) angle addition
3) $\angle 1 + \angle 2 \cong \angle 2 + \angle 3$	3) Transitive POE
4) $\angle 1 \cong \angle 3$	4) Subtraction POE
5) $\overline{BA} \cong \overline{DA}$	5) Def. of midpoint
6) $\Delta BEA \cong \Delta DCA$	6) SAS

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

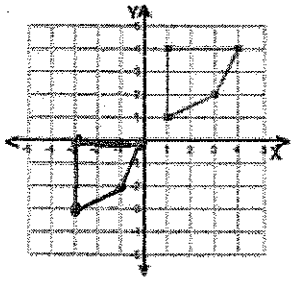
1) Translation: 4 down



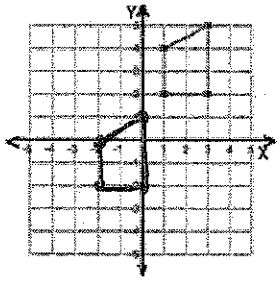
2) Translation: 5 right and 2 down



3) Translation: 4 left and 4 down

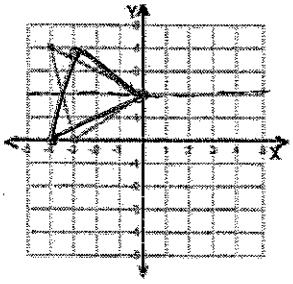


4) Translation: 3 left and 4 down

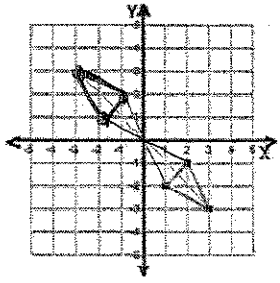


ccw = counterclockwise

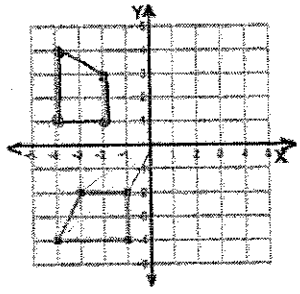
1) Reflection: Across the line y = 2



4) Rotation: 180° about the origin



6) Rotation: 90° clockwise about the origin



Systems of Equations Word Problems

Date_____ Period__

1) Find the value of two numbers if their sum is 12 and their difference is 4.

$x + y = 12$
$x - y = 4$
$2x = 16 \rightarrow$ **x = 8 y = 4**

2) The difference of two numbers is 3. Their sum is 13. Find the numbers.

$x - y = 3$
$x + y = 13$
$2x = 16$
x = 8 y = 5

3) Flying to Kampala with a tailwind a plane averaged 158 km/h. On the return trip the plane only averaged 112 km/h while flying back into the same wind. Find the speed of the wind and the speed of the plane in still air.

S = plane speed in km/hr W = wind speed in km/hr

$S + W = 158$
$S - W = 112$
$2S = 270$
S = 135

$135 + W = 158$
$-135 \quad -135$
W = 23

4) The school that Stefan goes to is selling tickets to a choral performance. On the first day of ticket sales the school sold 3 senior citizen tickets and 1 child ticket for a total of $38. The school took in $52 on the second day by selling 3 senior citizen tickets and 2 child tickets. Find the price of a senior citizen ticket and the price of a child ticket.

S = price of senior ticket
C = price of child ticket

$3S + 1C = 38$
$-(3S + 2C = 52)$
$-C = -14$
C = $14

$3S + 14 = 38$
$3S = 24$
S = $8

5) The sum of the digits of a certain two-digit number is 7. Reversing its digits increases the number by 9. What is the number?

$61 - 16 = 45$
$52 - 25 = 27$
$43 - 34 = 9$

34

6) A boat traveled 210 miles downstream and back. The trip downstream took 10 hours. The trip back took 70 hours. What is the speed of the boat in still water? What is the speed of the current?

b = 12 m/h
c = 9 m/h

s	t	d
b + c	10	210
b − c	70	210

$10(c + b) = 210$

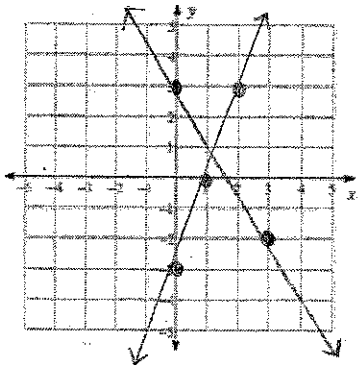
$\frac{1}{10}(10b + 10c = 210)$
$70b - 70c = 210$
$70b + 70c = 1470$
$140b = 1680$

c = speed of current
b = speed of

Solve each system by graphing.

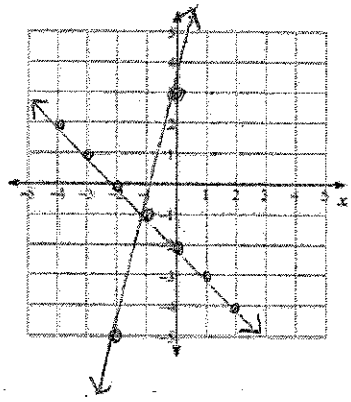
1) $y=-\frac{5}{3}x+3$

$y=\frac{1}{3}x-3$



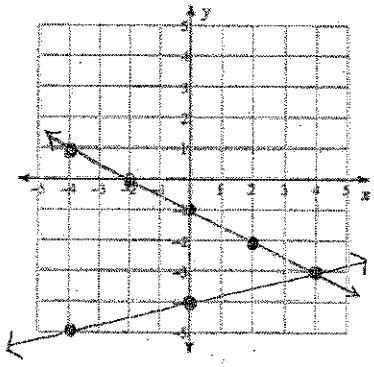
2) $y=4x+3$

$y=-x-2$



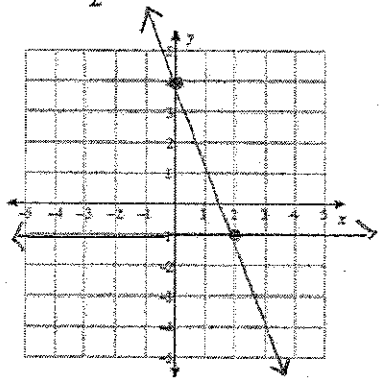
3) $y=-\frac{1}{2}x-1$

$y=\frac{1}{4}x-4$



4) $y=-1$

$y=-\frac{5}{2}x+4$



Find the slope of the line through each pair of points.

$m=\frac{y_2-y_1}{x_2-x_1}$

1) (19, −16), (−7, −15)

$\frac{-16+15}{19+7}=\frac{-1}{26}$

2) (1, −19), (−2, −7)

$\frac{-19+7}{1+2}=\frac{-8}{3}$

3) (−4, 7), (−6, −4)

$\frac{7+4}{-4+6}=\frac{11}{2}$

4) (20, 8), (9, 16)

$\frac{8-16}{20-9}=\frac{-8}{11}=\frac{8}{11}$

Find the slope of each line.

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

$-5/2$

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

$-4/3$

3) $y=-x+3$

-1

4) $y=-4x-1$

-4

5) $2x-y=1$

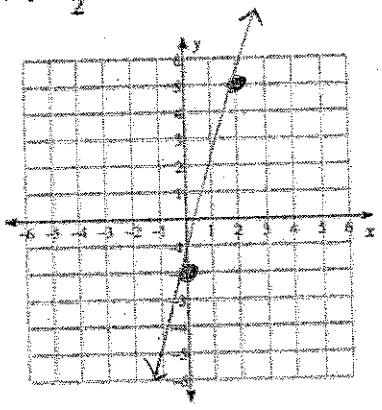
$m=\frac{-a}{b}=\frac{-2}{-1}=2$

6) $x+2y=-8$

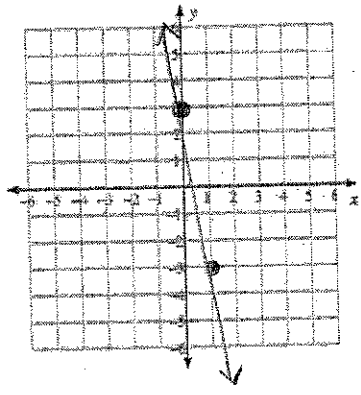
$-\frac{1}{2}$

Sketch the graph of each line.

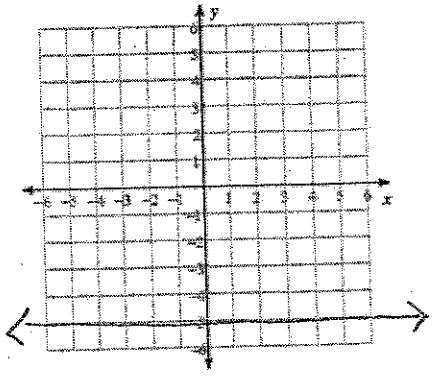
1) $y=\frac{7}{2}x-2$



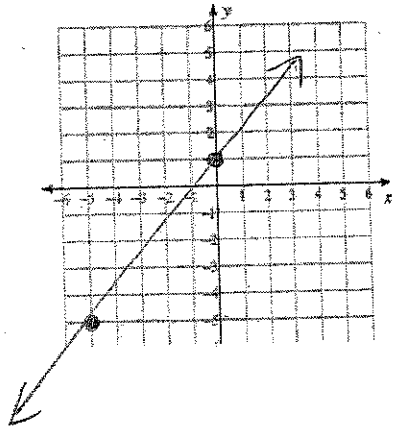
2) $y=-6x+3$



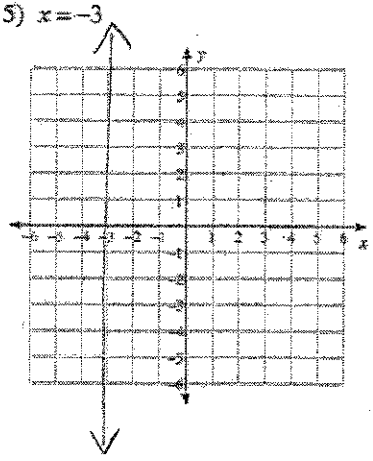
3) $y=-5$



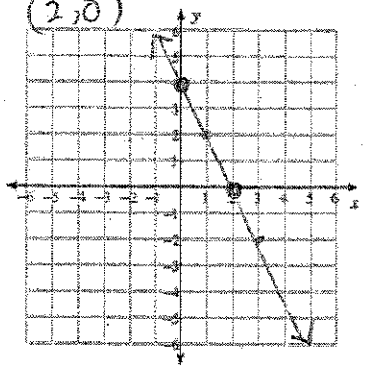
4) $y=\frac{6}{5}x+1$



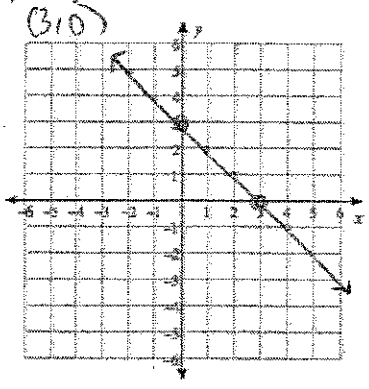
5) $x = -3$



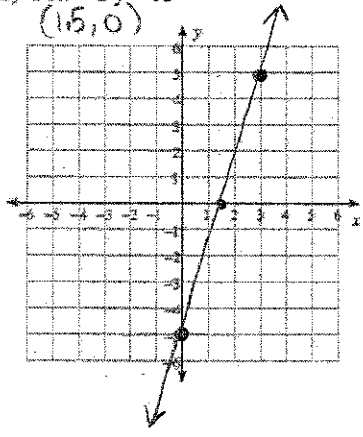
6) $2x + y = 4$ (0, 4) (2, 0)



7) $x + y = 3$ (0, 3) (3, 0)



8) $10x - 3y = 15$ (6, −5) (1.5, 0)



Write the standard form of the equation of the line through the given point with the given slope.

9) through: (1, 2), slope = 7

$y - 2 = 7(x - 1)$

10) through: (3, −1), slope = −1

$y + 1 = -1(x - 3)$

11) through: (−2, 5), slope = −4

$y - 5 = -4(x + 2)$

12) through: (3, 5), slope = $\frac{5}{3}$

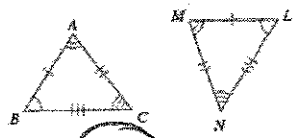
$y - 5 = \frac{5}{3}(x - 3)$

Complete each congruence statement by naming the corresponding angle or side.

1) $\Delta DEF \cong \Delta KJI$

$\overline{FD} \cong ?$ $\overline{IK}$

2) $\Delta BAC \cong \Delta LMN$



$\angle A \cong ?$ $\angle M$

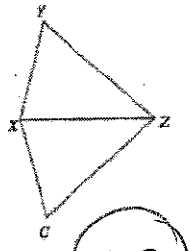
3) $\Delta TUV \cong \Delta GFE$

$\angle U \cong ?$ $\angle F$

4) $\Delta WVU \cong \Delta GHI$

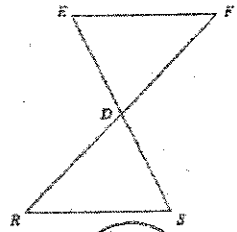
$\angle W \cong ?$ $\angle G$

5) $\Delta ZXY \cong \Delta ZXC$



$\angle Y \cong ?$ $\angle C$

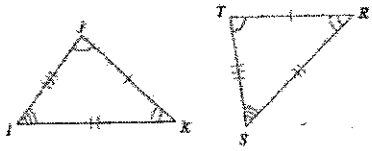
6) $\Delta DEF \cong \Delta DSR$



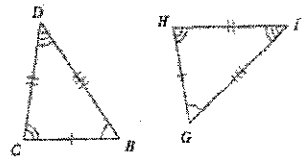
$\angle F \cong ?$ $\angle R$

Write a statement that indicates that the triangles in each pair are congruent.

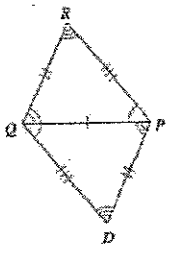
7) $\Delta IJK \cong \Delta STR$



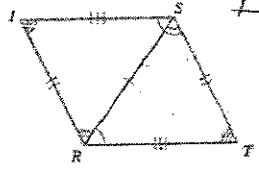
8) $\Delta DBC \cong \Delta IGH$



9) $\Delta PQR \cong \Delta QPD$

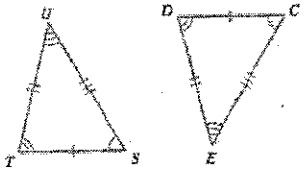


10) $\Delta SRI \cong \Delta RST$



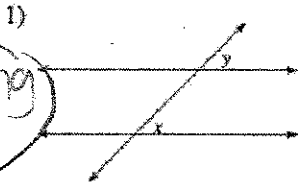
11) $\Delta XWV \cong \Delta EDC$

12) $\Delta STU \cong \Delta CDE$

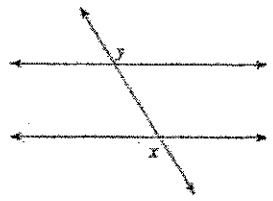


Identify each pair of angles as corresponding, alternate interior, alternate exterior, or ~~consecutive interior~~ same-side.

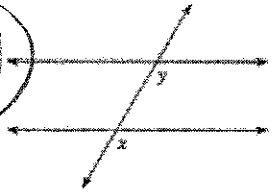
1) corresponding ∠s



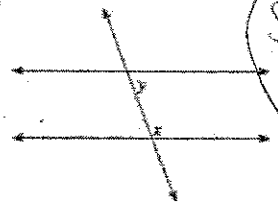
2) alternate exterior ∠s



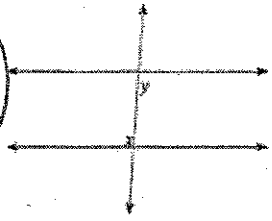
3) corresponding ∠s



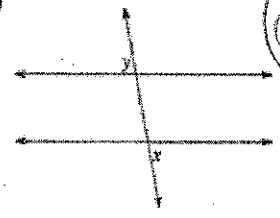
4) same-side interior ∠s (consecutive)



5) alternate interior ∠s

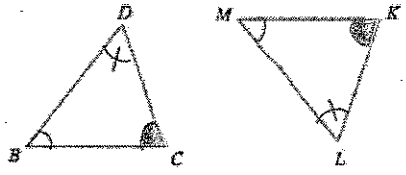


6) alternate exterior ∠s

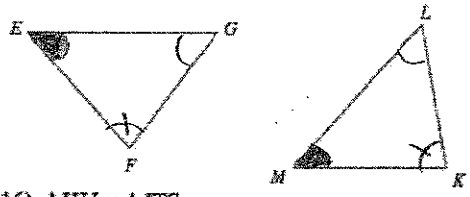


Mark the angles and sides of each pair of triangles to indicate that they are congruent.

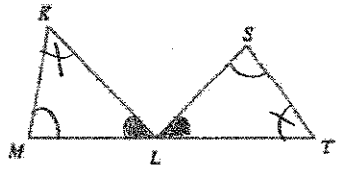
13) $\Delta BDC \cong \Delta MLK$



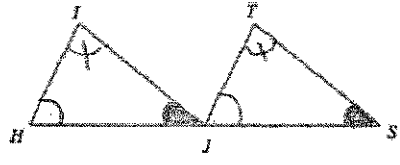
14) $\Delta GFE \cong \Delta LKM$



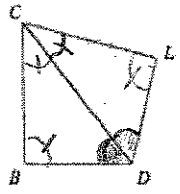
15) $\Delta MKL \cong \Delta STL$



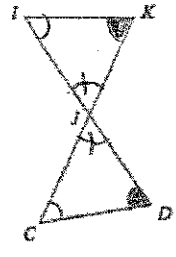
16) $\Delta HIJ \cong \Delta JTS$



17) $\Delta CDB \cong \Delta CDL$



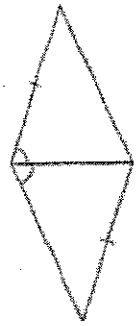
18) $\Delta JIK \cong \Delta JCD$



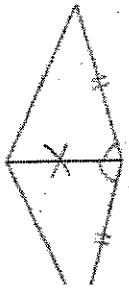
State if the two triangles are congruent. If they are, state how you know.

1) 

yes SAS

2) 

NO!

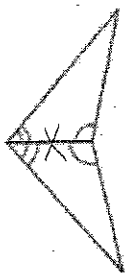
3) 

yes SAS

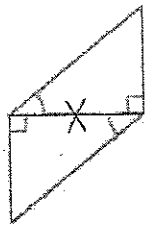
4) 

NO!

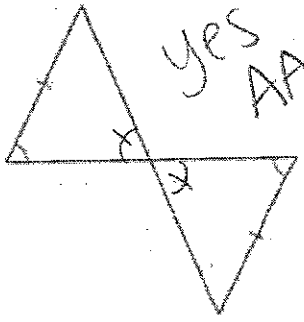
State if the two triangles are congruent. If they are, state how you know.

1) 

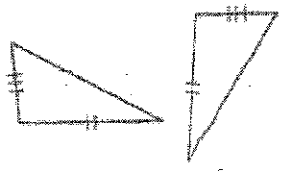
yes ASA

2) 

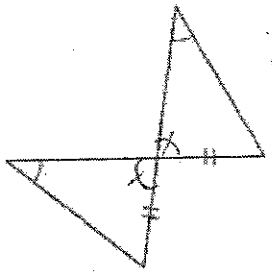
yes ASA

3) 

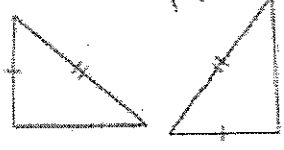
yes AAS

4) 

NO!

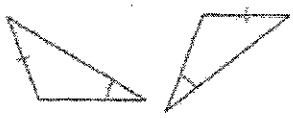
5) 

yes AAS

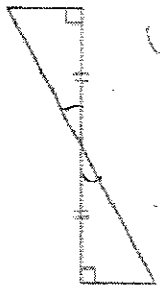
6) 

NO!

5) NO!



6)

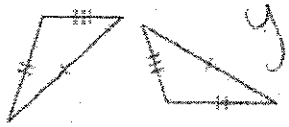


yes
ASA

NO!

7)

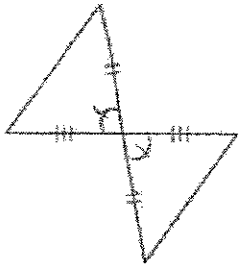
8)



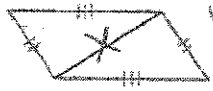
yes
SSS

yes
SAS

9)

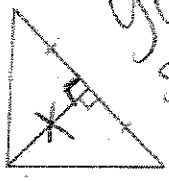


10)



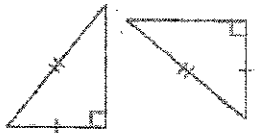
yes
SSS

1)



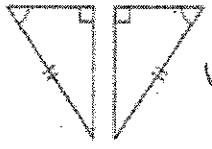
yes
SAS

2)



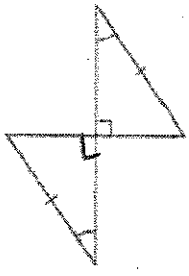
yes
HL

3)



yes
AAS

4)

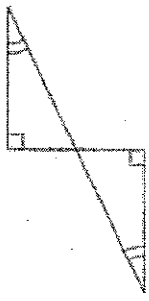


yes
AAS

5)

yes
AAS

6)



NO!