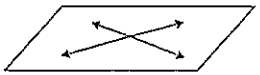
WHS Diff Geometry S1 Final Review

Notes:

The unit measure on all graphs is one unless otherwise indicated.
Diagrams are not necessarily drawn to scale.

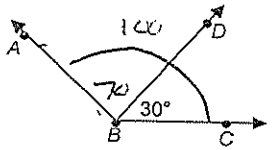
1. Describe the lines in the sketch.



A. coplanar and intersecting
B. coplanar and nonintersecting
C. noncoplanar and intersecting
D. noncoplanar and nonintersecting

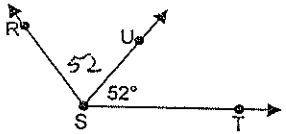
2. If $m\angle ABC = 100°$, find $m\angle ABD$.

A. 60°
B. 70°
C. 80°
D. 90°



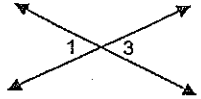
3. $\overline{SU}$ is the bisector of $\angle RST$. Find $m\angle RST$ and $m\angle RSU$.

A. $m\angle RST = 52°$, $m\angle RSU = 26°$
B. $m\angle RST = 90°$, $m\angle RSU = 38°$
C. $m\angle RST = 104°$, $m\angle RSU = 52°$
D. $m\angle RST = 114°$, $m\angle RSU = 52°$



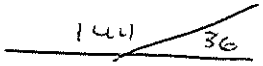
4. Which answer best describes how $\angle 1$ and $\angle 3$ are related?

A. complementary angles
B. linear pair of angles
C. supplementary angles
D. vertical angles



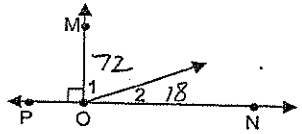
5. $\angle A$ and $\angle B$ are supplementary angles. If $m\angle B = 36°$, find $m\angle A$.

A. 54°
B. 72°
C. 144°
D. 180°



6. $m\angle 1 = 72°$. Find $m\angle 2$.

A. 8°
B. 18°
C. 28°
D. 72°



7. Write as a **biconditional** statement: "If two lines are perpendicular, then they meet to form right angles."

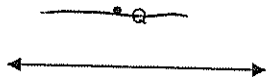
A. Two lines are perpendicular if and only if they meet to form right angles.
B. Two lines are perpendicular if they meet to form right angles.
C. If two lines meet to form right angles, then they are perpendicular.
D. If two lines are perpendicular, then they meet to form right angles.

8. Identify the property used to complete the statement:
If $3x - 4 = 14$, then $3x = 18$.

A. Addition Property of Equality
B. Division Property of Equality
C. Multiplication Property of Equality
D. Subtraction Property of Equality

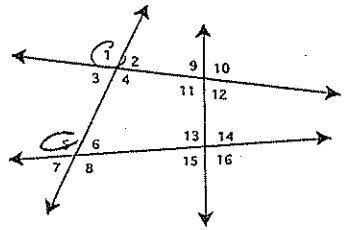
9. How many lines through point Q are parallel to line m?

A. zero
B. one
C. two
D. infinitely many

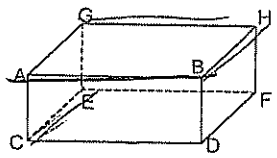


10. What type of angles are $\angle 1$ and $\angle 5$?

A. alternate exterior
B. alternate interior
C. consecutive interior
D. corresponding

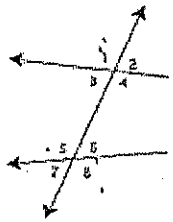


11. Name a line **skew** to $\overline{AB}$.



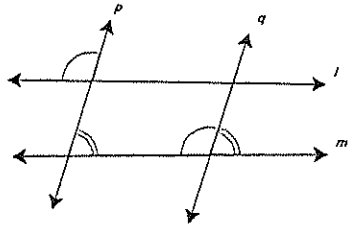
A. $\overline{CD}$
B. $\overline{BH}$
C. $\overline{GH}$
D. $\overline{CE}$

12. Which pair of angles are **alternate exterior** angles?



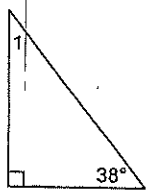
A. ∠1 and ∠5
B. ∠1 and ∠8
C. ∠2 and ∠4
D. ∠3 and ∠6

13. Name a pair of lines that must be parallel and state the reason for your conclusion.



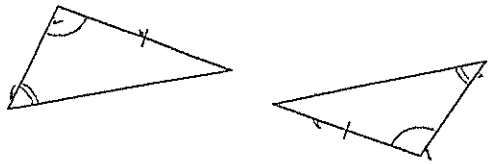
A. p and q; corresponding angles are congruent.
B. p and q; alternate interior angles are congruent.
C. l and m; corresponding angles are congruent.
D. l and m; alternate exterior angles are congruent.

14. Find the measure of ∠1.



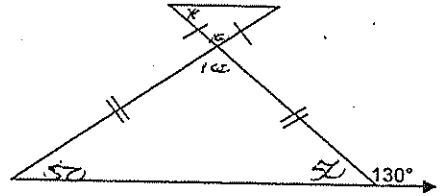
A. 38°
B. 42°
C. 52°
D. 68°

15. What theorem or postulate is used to prove the two triangles are congruent?



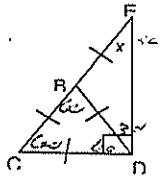
A. AAA
B. AAS
C. SAS
D. SSS

16. Find the value of x.



A. 50°
B. 80°
C. 100°
D. 130°

17. Find the measure of x.



A. 15°
B. 30°
C. 45°
D. 60°

18. What is the **converse** of the statement "If I live in Lincoln, then I live in Nebraska"?

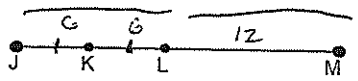
1. If I do not live in Lincoln, then I do not live in Nebraska.
2. If I do not live in Lincoln, then I live in Nebraska.
3. If I live in Nebraska, then I do not live in Lincoln.
4. If I live in Nebraska, then I live in Lincoln.

19. Find the distance between the points (3,9) and (-1,2).

$\sqrt{7^2 + 4^2}$
$\sqrt{49 + 16}$
$\sqrt{65}$

A. $\sqrt{11}$
B. $\sqrt{53}$
C. $\sqrt{65}$
D. $\sqrt{121}$

20. If JK = KL, L is the midpoint of $\overline{JM}$, and KL = 6, then what is the measure of $\overline{KM}$?

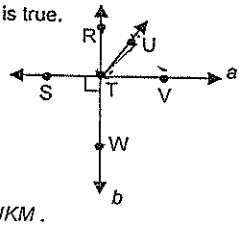


A. 3
B. 6
C. 12
D. 18

21. Choose the property being illustrated: $A\bar{B} = AB$.

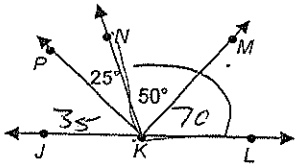
A. Distributive Property of Equality
B. Reflexive Property of Equality
C. Symmetric Property of Equality
D. Transitive Property of Equality

22. Use the diagram to determine which statement is true.



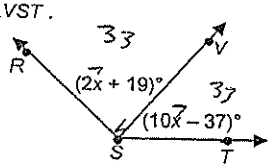
A. Points W, T, and V are collinear.
B. $\overline{TU}$ is perpendicular to line a.
C. $\angle UTV$ and $\angle STW$ are vertical angles.
D. $\angle RTU$ and $\angle UTV$ are complementary.

23. Given the figure with $m\angle NKL = 120°$, find $m\angle JKM$.



A. 25°
B. 35°
C. 100°
D. 110°

24. $\overline{SV}$ bisects $\angle RST$. Find $m\angle VST$.



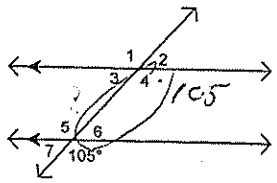
A. 7°
B. 14°
C. 33°
D. 66°

25. Which would be the correct statement for step 2 in the proof?

STATEMENTS	REASONS
1. $\angle 1$ and $\angle 2$ are vertical angles	1. Given
2. _____	2. Vertical Angles Theorem

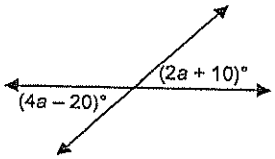
A. $\angle 1$ and $\angle 2$ are complementary.
B. $\angle 1$ and $\angle 2$ are congruent.
C. $\angle 1$ and $\angle 2$ are supplementary.
D. $\angle 1$ and $\angle 2$ are a linear pair.

26. Find $m\angle 4$ and $m\angle 7$.



A. $m\angle 4 = 105°$, $m\angle 7 = 105°$
B. $m\angle 4 = 105°$, $m\angle 7 = 75°$
C. $m\angle 4 = 75°$, $m\angle 7 = 105°$
D. $m\angle 4 = 75°$, $m\angle 7 = 75°$

27. Find the value of a.



A. 13.3
B. 15
C. 31.3
D. 40

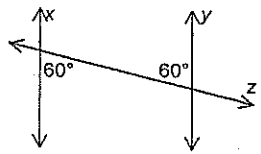
28. If $\angle 1$ and $\angle 2$ are complementary and $\angle 2$ and $\angle 3$ are complementary, what is always true about $\angle 1$ and $\angle 3$?

A. They are complementary.
B. They are congruent.
C. They are supplementary.
D. They are vertical angles.

29. Find counterexample to show the following conditional statement is false.
"If a number is prime, then it is odd."

A. 1
B. 2
C. 5
D. 6

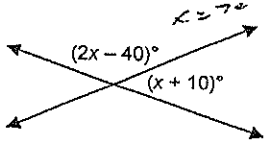
30. Which can be used to show $x \parallel y$?



A. If two lines are cut by a transversal so that alternate interior angles are congruent, then the lines are parallel.
B. If two lines are cut by a transversal so that alternate exterior angles are congruent, then the lines are parallel.
C. If two lines are cut by a transversal so that consecutive interior angles are congruent, then the lines are parallel.
D. If two lines are cut by a transversal so that corresponding angles are congruent, then the lines are parallel.

31. Find the value of x.

A. 50
B. 70
C. 100
D. 150



32. Given $A(8,-10)$ and $B(6,-2)$, find the midpoint of AB.

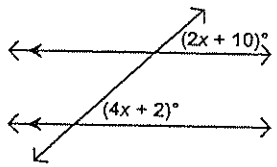
A. (-6,7)
B. (1,-4)
C. (7,-6)
D. (14,-12)

33. If two angles form a linear pair, then the angles are supplementary. $\angle X$ and $\angle Y$ form a linear pair. Which conclusion represents a proper application of the **Law of Detachment** to these statements?

A. $\angle X$ and $\angle Y$ are vertical angles.
B. $\angle X$ and $\angle Y$ have the same measure.
C. $\angle X$ and $\angle Y$ are complementary.
D. $\angle X$ and $\angle Y$ are supplementary.

34. Find the value of x.

A. 4
B. 6
C. 18
D. 32

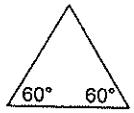


35. Classify the triangle according to its angles.

A. acute
B. equiangular
C. obtuse
D. right

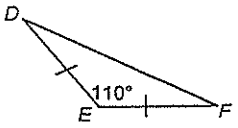
36. Classify the triangle according to its sides.

A. equilateral
B. right
C. scalene



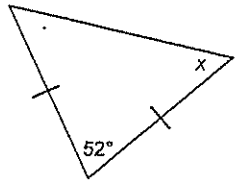
37. $\triangle DEF$ is an obtuse isosceles triangle. Identify the relationship between angles D and F.

A. $\angle D$ and $\angle F$ are complementary angles.
B. $\angle D$ and $\angle F$ have the same measure.
C. $\angle D$ and $\angle F$ are a linear pair.
D. $\angle D$ and $\angle F$ are supplementary angles.



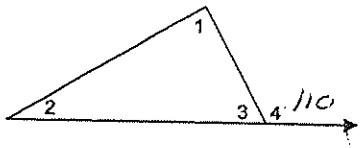
38. Find the measure of x.

A. 52°
B. 64°
C. 104°
D. 128°



39. If $m\angle 4 = 110°$, then which statement **must** be true?

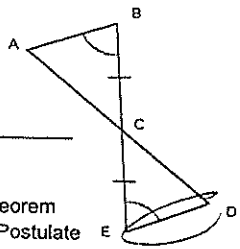
A. $m\angle 1 = 110°$
B. $m\angle 2 = 110°$
C. $m\angle 1 > 110°$
D. $m\angle 2 < 110°$



40. Which statement would best complete the proof?

Given: $\angle B \cong \angle E$, $\overline{BC} \cong \overline{EC}$
Prove: $\overline{ED} \cong \overline{BA}$

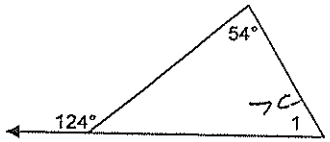
STATEMENTS	REASONS
1. $\angle B \cong \angle E$	1. Given
2. $\overline{BC} \cong \overline{EC}$	2. Given
3. $\angle ACB \cong \angle DCE$	3. Vertical Angles Theorem
4. $\triangle ACB \cong \triangle DCE$	4. ASA Congruence Postulate
5. $\overline{ED} \cong \overline{BA}$	5. _____



A. Angle, Side, Angle
B. Corresponding Parts of Congruent Triangles are Congruent
C. Side, Angle, Side
D. Side, Side, Side

41. Find m∠1.

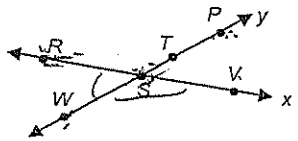
A. 112°
B. 70°
C. 68°
D. 54°



Use the diagram for #42 – 46.

42. Name three collinear points.

A. W, S, V
B. W, V, P
C. R, S, P
D. R, S, V



43. What is another name for line *y*?

A. $\overleftrightarrow{P}$
B. $\overleftrightarrow{W}$
C. $\overleftrightarrow{PT}$
D. $\overleftrightarrow{PV}$

44. Name two opposite rays.

A. $\overrightarrow{SR}$ and $\overrightarrow{SV}$
B. $\overrightarrow{SR}$ and $\overrightarrow{SW}$
C. $\overrightarrow{ST}$ and $\overrightarrow{SV}$
D. $\overrightarrow{ST}$ and $\overrightarrow{SR}$

45. Name two vertical angles

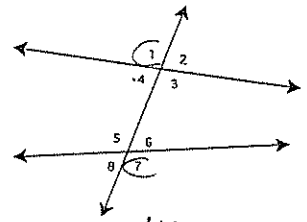
A. ∠*RSW* and ∠*PSV*
B. ∠*RSW* and ∠*WSV*
C. ∠*RSP* and ∠*RSV*
D. ∠*RSP* and ∠*PSW*

180
110
46
45
25

46. Name one linear pair of angles.

A. ∠*RSW* and ∠*PSV*
B. ∠*RSW* and ∠*WSV*
C. ∠*RSP* and ∠*RSV*
D. ∠*RSP* and ∠*PSW*

47. Use the diagram to find each.



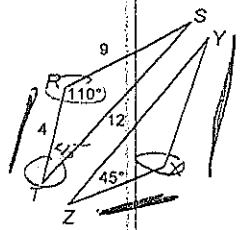
a) one pair of alternate exterior angles a) 1+7 or 2+8

b) one pair of alternate interior angles b) 3+5 or 4+6

c) one pair of consecutive interior angles c) 4+5 or 3+6

d) one pair of corresponding angles d) 1+5 or 4+8 or 2+6 or 3+7

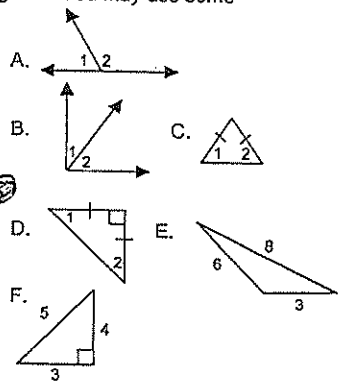
48. Use the diagram, where $\Delta RST \cong \Delta XYZ$, to find the missing measures.



m∠S = 25
m∠T = 45
m∠X = 110
m∠Y = 25
XZ = 4
XY = 9
YZ = 12

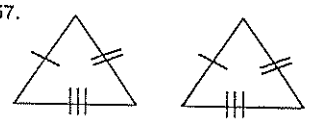
Matching. Match the description to the appropriate diagram. You may use some diagrams more than once.

49. scalene right triangle F
50. isosceles right triangle D
51. scalene triangle E
52. isosceles triangle C, D
53. complementary base angles, ∠1, ∠2 D
54. congruent base angles, ∠1, ∠2 C
55. supplementary angles, ∠1, ∠2 A
56. complementary angles, ∠1, ∠2 B



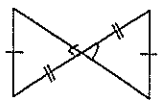
 # 57 – 62, Decide whether enough information is given to prove that the triangles are congruent. If there is enough information, state the congruence postulate you would use.

57.



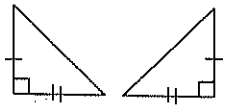
yes SSS

58.



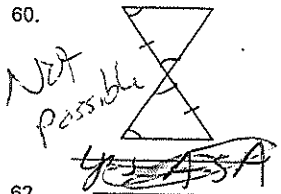
NC

59.

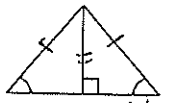


yes SAS

60.

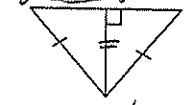


61.



yes HL

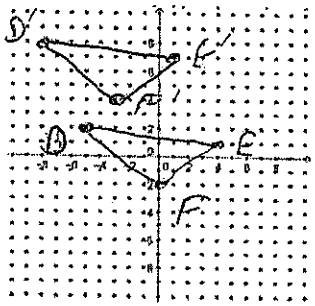
62.



yes HL

-8 8 : 7 -3 4

63. The vertices of ΔDEF are D(-5, 2), E(4, 1) and F(0, -2). Graph the image of the triangle using the transformation (x, y) → (x – 3, y + 6).



64. Use the translation that is defined by the coordinate notation (x, y) → (x + 3, y – 5).

a. What is the image of (4, 7)? (7, 2)

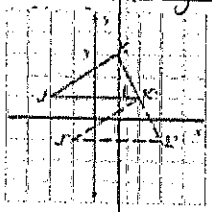
b. What is the preimage of (3, -2)? (0, 3)

c. What is the preimage of (-6, 5)? (-9, 10)

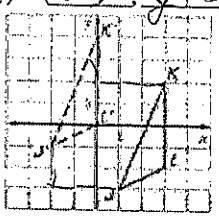
d. What is the image of (-2, -1)? (1, -6)

65. Write the translation using coordinate notation.

a. (x, y) → (x+1, y-2)

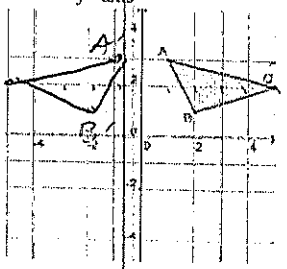


b. (x, y) → (x-3, y+2)



66. Draw the reflection of ΔABC in the given line. List the coordinates of the vertices.

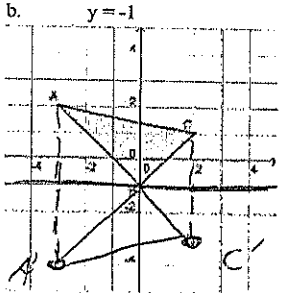
a. y –axis



A' = (-1, 3) B' = (-2, 1)

C' = (-5, 2)

b. y = -1

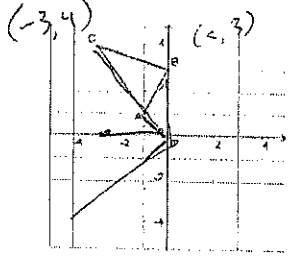


A' = (-3, -4) B' = (0, -1)

C' = (2, -3)

67. Rotate the figure about the origin. List the coordinates of A′, B′, and C′.

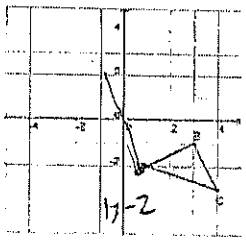
a. 90° ccw



A′ = (−1, −1) B′ = (−3, 0)

C′ = (−4, −3)

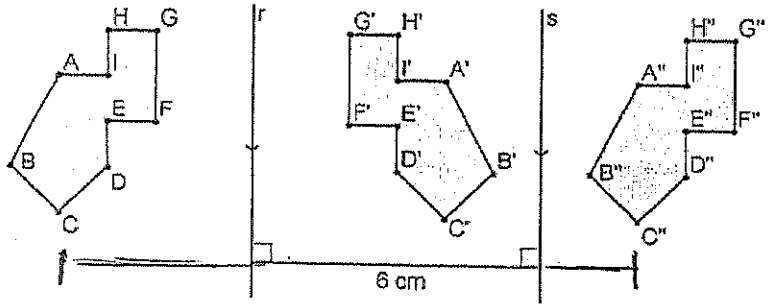
b. 180°



A′ = (−1, 2) B′ = (−3, 1)

C′ = (−4, 3)

68. Below is an example of a double reflection over parallel lines r and s. The distance between lines r and s is 6 cm, what is the distance from point H to point H″?



12

$\frac{4}{6} = \frac{?}{x}$

$\frac{2}{3} \quad \frac{9}{x}$

13.5

$\frac{5}{2} = \frac{15}{CB}$

Use the diagrams to answer each dilation problem.

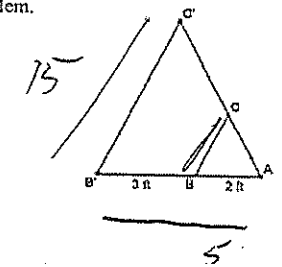
69. What is the scale factor?

Is the dilation a reduction or enlargement?

If C′B′ is 15 ft, find CB.

$k = \frac{5}{2}$ Enlargt

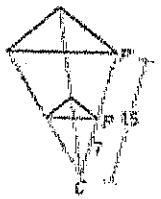
CB = 6



70. What is the scale factor?

Is the dilation a reduction or enlargement?

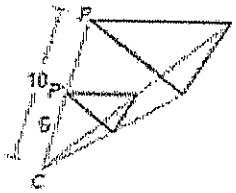
$k = \frac{15}{7}$ Enl



71. What is the scale factor?

Is the dilation a reduction or enlargement?

$k = \frac{5}{10}$ Red



72. Find x

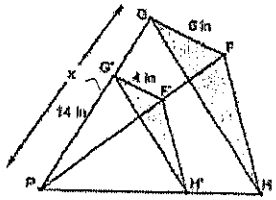
If F′H′ = 9 inches, find FH.

$\frac{4}{6} = \frac{14}{x}$

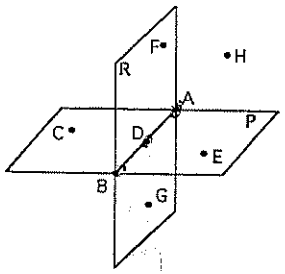
$\frac{2}{3} \overset{\times 7}{=} \frac{14}{x}$

$\times 7$

$x = 21$



Refer to the figure at the right for Questions 73 and 74.



73. Points A, B, and D

A. determine a plane.
B. are collinear.
C. are contained in only plane $\mathcal{P}$
D. are noncoplanar points.

74. What is the intersection of planes $\mathcal{P}$ and $\mathcal{R}$?

A. points A, D, and B
B. $\overleftrightarrow{AB}$
C. $\overline{AB}$
D. $\overline{AD}$

75. Find the length of the segment with endpoints L (- 1, - 3) and M (- 9, 12).

A. 8
B. 15
C. 17
D. 23

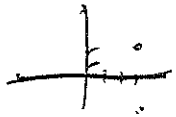
$\sqrt{15^2 + 8^2}$

225 64

289

76. If the point (3, 2) is reflected in the *x*-axis, then what is its image?

A. (–3, –2)
B. (–3, 2)
C. (3, –2)
D. (–2, –3)



77. Find the coordinates of a midpoint of the segment with endpoints D (6, 6) and E (- 2, 2).

A. (3, 4)
B. (2, 4)
C. (4, 8)
D. (1, - 1)

2, 4

78. If two complementary angles have measure of 4x + 14 and 3x - 22, the smaller angle has what measure?

A. 14°
B. 20°
C. 56°
D. 90°

42

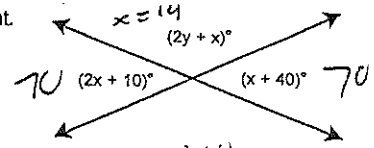
$7x - 8 = 90$

$7x - 8 = 9$

$7x = 98$

79. Find the value of y in the figure at the right.

A. 10
B. 30
C. 40
D. 95



$2x + 10 = x + 40$

$x = 30$

$2y + 30 + 70 = 180$

$2y = 80$

$5x - 11 = 3x + 5$

$2x = 16$

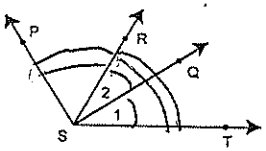
$x = 8$

58

80. Find m∠PST if $\overrightarrow{SQ}$ and $\overrightarrow{SR}$ bisect ∠RST and ∠PST, respectively, m∠1 = 5x - 11, and m∠2 = 3x + 5.

A. 8°
B. 29°
C. 87°
D. 116°

29 29



81. Identify a counterexample for the conjecture, *All composite numbers are even.*

A. 16 is a composite number.
B. 2 is an even number.
C. 9 is a composite number.
D. none of these.

82. Identify the if-then form of the statement *All bicycles have two wheels.*

A. If a vehicle has two wheels, then it is a bicycle.
B. If a vehicle is a bicycle, then it has two wheels.
C. If a vehicle is not a bicycle, then it does not have two wheels.
D. none of these.

83. Identify the contrapositive of the statement
If yesterday was Sunday, then today is Monday.

A. If yesterday was not Sunday, then today is not Monday.
B. If today is Monday, then yesterday was Sunday.
C. If today is not Monday, then yesterday was not Sunday.
D. none of these.

84. Identify the property of equality that justifies the statement,
If PQ + BC = AB + BC, then PQ = AB.

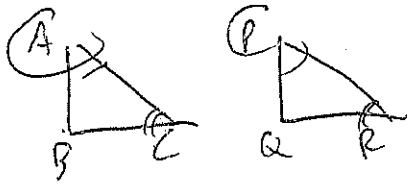
A. Substitution
B. Symmetric
C. Transitive
D. Subtraction

85. Find the slope of the line perpendicular to the line passing through points (- 3, 3) and (5, - 7).

A. –2 B. $-\frac{5}{4}$ C. $\frac{4}{5}$ D. $\frac{5}{4}$

$-7-3$ -10 -5

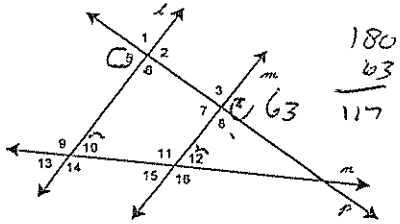
$5--3$ 8 4



Use the figure at the right for questions 86 through 88.

86. Identify the special angle pair name for $\angle 5$ and $\angle 4$.

A. alternate interior
B. vertical
C. corresponding
D. alternate exterior



87. Given $\ell \parallel m$ and $m\angle 4 = 63°$, find $m\angle 6$.

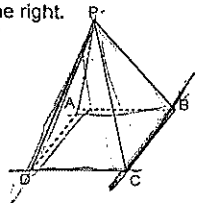
A. 27°
B. 63°
C. 105°
D. 117°

88. Given $m\angle 10 = 3x - 2$ and $m\angle 12 = 70°$, find the value of x so that $\ell \parallel m$.

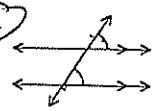
A. 24
B. 68
C. 70
D. 72

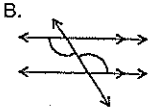
89. Consider the three-dimensional figure shown at the right. How many pairs of skew segments are shown?

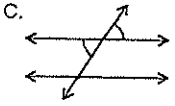
A. 2
B. 4
C. 6
D. 8

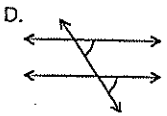


90. Which figure shows the **given** in a proof of the theorem: *If two lines in a plane are cut by a transversal so that corresponding angles are congruent, then the lines are parallel?* (It should show only the given.)

A.


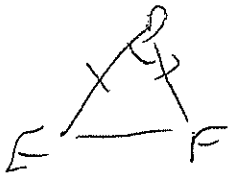
B.


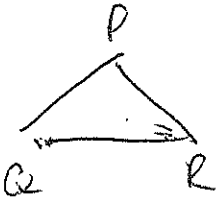
C.


D.


91. In ΔDEF, if $\overline{DE} \cong \overline{DF}$ and $\overline{EF}$ is the hypotenuse, then ΔDEF is

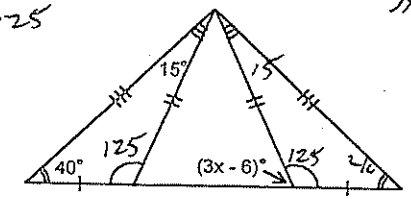
A. acute and scalene
B. right and scalene
C. right and isosceles
D. obtuse and isosceles





92. Find the value of x.

A. 17
B. $43\frac{2}{3}$
C. $15\frac{1}{3}$
D. $20\frac{1}{3}$



93. For ΔABC and ΔPQR if $\angle A \cong \angle P$ and $\angle C \cong \angle R$, then

A. $\Delta ABC \cong \Delta PQR$
B. $\angle B \cong \angle Q$
C. $\overline{AB} \cong \overline{PQ}$
D. all of these

94. Which of the following is not a reason used to prove the congruence of triangles?

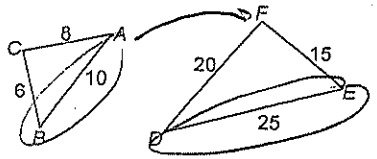
A. SSS Congruence Postulate
B. AAS Congruence Theorem
C. ASA Congruence Postulate
D. SSA Congruence Theorem

95. In isosceles ΔPQR, $\angle P$ is the vertex angle, If $m\angle Q = 8x - 4$ and $m\angle R = 5x + 14$, find the measure of $\angle P$.

A. 6°
B. 12°
C. 44°
D. 92°

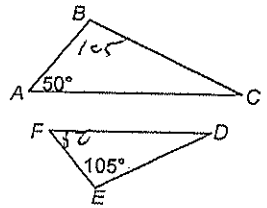
96. If $\Delta ABC \sim \Delta DEF$, then what is the scale factor of ΔABC to ΔDEF?

A. 1:2
B. 2:5
C. 5:2
D. 25:8



97. If $\Delta ABC \sim \Delta FED$, then what is the $m\angle D$?

A. 50°
B. 35°
C. 25°
D. 15°



-7 -13

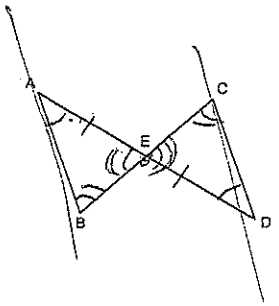
98. Use the translation $(x,y) \rightarrow (x+3, y-7)$. What is the **image** of $(4, -6)$?

A. $(7, -13)$
B. $(7, -1)$
C. $(-1, -13)$
D. $(-1, 1)$

99. Given: $\overline{AB} \parallel \overline{CD}$

E is the midpoint of $\overline{AD}$

Prove: $\Delta AEB \cong \Delta DEC$



Three students say the following about the proof:

Student #1: said, "I can prove this using AAS."

Student #2: said, "I can prove this using ASA."

Student #3: said, "I can prove this using SAS."

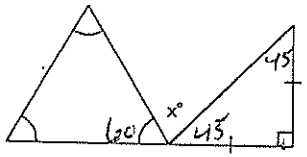
Who is correct?

B

A. Student #1 only
B. Students #1 and #2 only
C. Students #1 and #3 only
D. All three students

100. Solve for x.

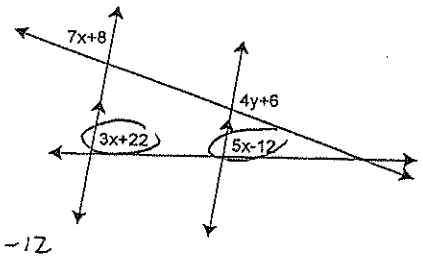
A. 45°
B. 60°
C. 75°
D. 85°



180
105
75

101. Find the value of x.

A. 17
B. 20
C. 21.25
D. 23



$3x + 22 = 5x - 12$

$34 = 2x$