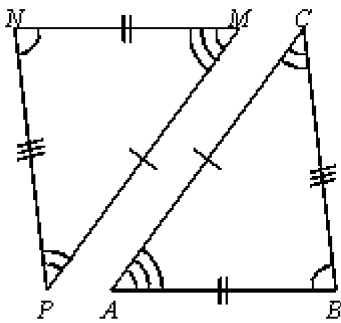# Geometry 1st semester Exam review

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. If $\triangle MNO \cong \triangle PQR$, which of the following can you
    NOT conclude as being true?
    a. $\overline{MN} \cong \overline{PR}$ b. $\angle M \cong \angle P$ c. $\overline{NO} \cong \overline{QR}$
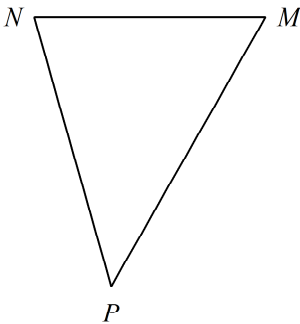   d. $\angle N \cong \angle Q$

2. $\angle ABC \cong$ ___?___

        a. $\angle PMN$ b. $\angle NPM$ c. $\angle NMP$
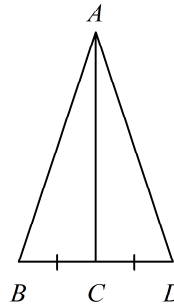   d. $\angle MNP$

3. Given $\triangle QRS \cong \triangle TUV$, $QS = 3v + 2$, and
    $TV = 7v - 6$, find the length of QS and TV.
    a. 2 b. 9 c. 8 d. 20

4. Name the angle included by the sides $\overline{PN}$ and $\overline{NM}$.
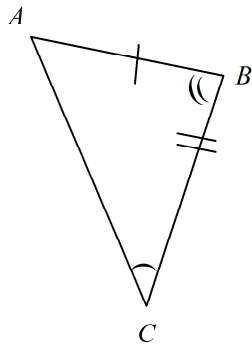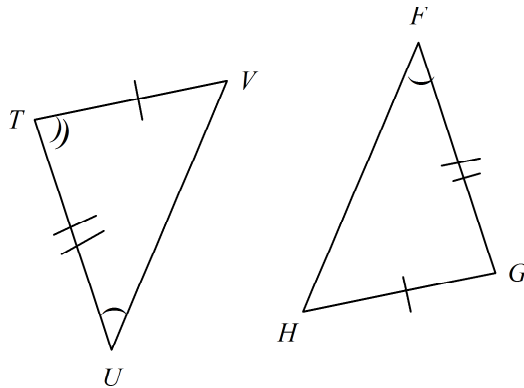

    a. $\angle N$_b. $\angle P$_c. $\angle M$ _d. none of these

5. What other information do you need in order to
    prove the triangles congruent using the SAS
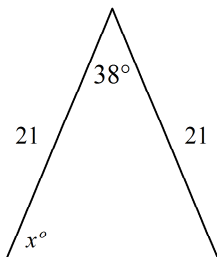   Congruence Postulate?

    a. $\angle BAC \cong \angle DAC$ b. $\overline{AC} \perp \overline{BD}$
    c. $\angle CBA \cong \angle CDA$ d. $\overline{AC} \cong \overline{BD}$

6. Which triangles are congruent by ASA?

a. $\triangle ABC$ and $\triangle TUV$ b. $\triangle VTU$ and $\triangle ABC$
c. $\triangle VTU$ and $\triangle HGF$ d. none

7. What is the value of x?

Drawing not to scale

a. $71°$ b. $142°$ c. $152°$ d. $76°$

8. What is a counterexample for the conjecture?
   Conjecture: Any number that is divisible by 4 is also divisible by 8.
   a. 24 b. 40 c. 12 d. 26

9. Which choice shows a true conditional, with the hypothesis and conclusion identified correctly?
   a. Yesterday was Monday if tomorrow is Thursday.
      Hypothesis: Tomorrow is Thursday.
      Conclusion: Yesterday was Monday.
   b. If tomorrow is Thursday, then yesterday was Tuesday.
      Hypothesis: Yesterday was Tuesday.
      Conclusion: Tomorrow is not Thursday.
   c. If tomorrow is Thursday, then yesterday was Tuesday.
      Hypothesis: Yesterday was Tuesday.
      Conclusion: Tomorrow is Thursday.
   d. Yesterday was Tuesday if tomorrow is Thursday.
      Hypothesis: Tomorrow is Thursday.
      Conclusion: Yesterday was Tuesday.

10. Which statement is a counterexample for the following conditional?
    If you live in Springfield, then you live in Illinois.
    a. Sara Lucas lives in Springfield. b. Jonah Lincoln lives in Springfield, Illinois. c. Billy Jones lives in Chicago, Illinois. d. Erin Naismith lives in Springfield, Massachusetts.

11. What is the converse of the following conditional?
    If a point is in the first quadrant, then its coordinates are positive.
    a. If a point is in the first quadrant, then its coordinates are positive.   b. If a point is not in the first quadrant,
    then the coordinates of the point are not positive.   c. If the coordinates of a point are positive, then
    the point is in the first quadrant.   d. If the coordinates of a point are not positive, then
    the point is not in the first quadrant.

12. Is the statement a good definition? If not, find a counterexample.
    A square is a figure with two pairs of parallel sides and four right angles.
    a. The statement is a good definition.   b. No; a rhombus is a counterexample.   c. No; a rectangle is a
    counterexample.   d. No; a parallelogram is a counterexample.

13. Use the Law of Detachment to draw a conclusion from the two given statements.

    If two angles are congruent, then they have equal measures.

    $\angle P$ and $\angle Q$ are congruent.

    a. $m\angle P + m\angle Q = 90$ b. $m\angle P = m\angle Q$ c. $\angle P$ is the complement of $\angle Q$.   d. $m\angle P \neq m\angle Q$

14. Use the Law of Detachment to draw a conclusion from the two given statements. If not possible, write *not
    possible*.
    I can go to the concert if I can afford to buy a ticket.
    I can go to the concert.
    a. I can afford to buy a ticket.   b. I cannot afford to buy the ticket.
    c. If I can go to the concert, I can afford the ticket.   d. not possible

15. Use the Law of Syllogism to draw a conclusion from the two given statements.
    If two lines intersect and form right angles, then the lines are perpendicular.
    If two lines are perpendicular, then they intersect and form 90° angles.
    a. The lines intersect and form 90° angles.
    b. If two lines do not intersect and form 90° angles, then they do not form right angles.
    c. The lines are perpendicular.
    d. If two lines intersect and form right angles, then they intersect and form 90° angles.

16. Name the Property of Equality that justifies this statement:
    If $p = q$, then $p - r = q - r$.
    a. Reflexive Property   b. Multiplication Property   c. Symmetric Property   d. Subtraction Property

Use the given property to complete the statement.

17. Transitive Property of Congruence
    If $\overline{CD} \cong \overline{EF}$ and $\overline{EF} \cong \overline{GH}$, then _____.
    a. $\overline{EF} \cong \overline{GH}$ b. $\overline{EF} \cong \overline{EF}$ c. $\overline{CD} \cong \overline{GH}$
    d. $\overline{CD} \cong \overline{EF}$

18. Multiplication Property of Equality
    If $6x \div 8 = 40$, then _____.
    a. $6x \cdot 8 = 320$_b. $40 = 6x \cdot 8$_c. $6x = 320$
    d. $40 = 6x \div 8$

19. Substitution Property of Equality
    If $y = 3$ and $8x + y = 12$, then _____.
    a. $8(3) - y = 12$ b. $3 - y = 12$ c. $8x + 3 = 12$
    d. $8x - 3 = 12$

20. Name the Property of Congruence that justifies the statement:
    If $\overline{XY} \cong \overline{WX}$, then $\overline{WX} \cong \overline{XY}$.
    a. Symmetric Property   b. Transitive Property
    c. Reflexive Property   d. none of these

21. Name the Property of Congruence that justifies this statement:
    If $\angle A \cong \angle B$ and $\angle B \cong \angle C$, then $\angle A \cong \angle C$.
    a. Transitive Property   b. Symmetric Property   c. Reflexive Property   d. none of these

22. Complete the two-column proof.

    Given: $11x - 6y = -1; x = 8$

    Prove: $\dfrac{89}{6} = y$

    $11x - 6y = -1; x = 8$ a. _____
    $88 - 6y = -1$ b. _____
    $-6y = -89$ c. _____
    $y = \dfrac{89}{6}$ d. _____
    $\dfrac{89}{6} = y$ e. _____

    a. a. Given
        b. Symmetric Property of Equality
        c. Subtraction Property of Equality
        d. Division Property of Equality
        e. Reflexive Property of Equality
    b. a. Given
        b. Substitution Property
        c. Subtraction Property of Equality
        d. Division Property of Equality
        e. Symmetric Property of Equality
    c. a. Given
        b. Substitution Property
        c. Subtraction Property of Equality
        d. Division Property of Equality
        e. Reflexive Property of Equality
    d. a. Given
        b. Substitution Property
        c. Subtraction Property of Equality
        d. Addition Property of Equality
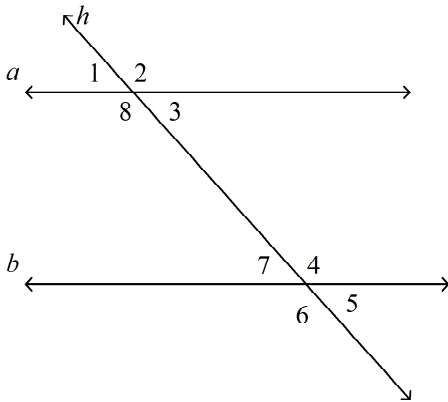   e. Symmetric Property of Equality

23. What is the value of x?

    $(7x - 8)°$

    $(6x + 11)°$

    Drawing not to scale
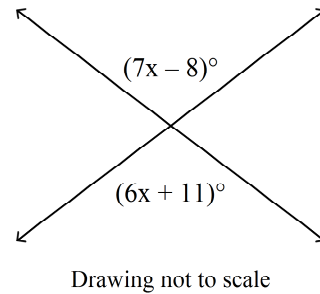
    a. −19   b. 125   c. 19   d. 55

24. Find the values of x and y.

    $4y°$

    $112°$

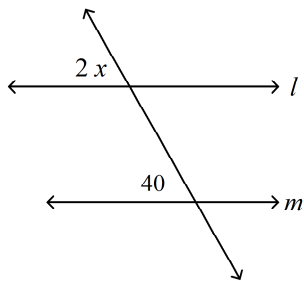 $7x + 7°$

    Drawing not to scale
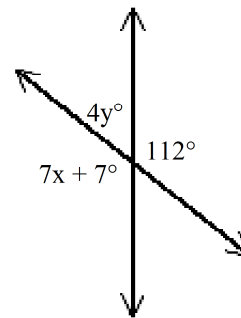
    a. $x = 15, y = 17$ b. $x = 112, y = 68$ c. $x = 68, y = 112$ d. $x = 17, y = 15$

**Use the diagram to find the following.**

25. Identify a pair of alternate exterior angles.
    a. $\angle 3$ and $\angle 4$ b. $\angle 1$ and $\angle 2$ c. $\angle 1$ and $\angle 6$
    d. $\angle 2$ and $\angle 6$

26. What are three pairs of corresponding angles?
    a. angles 1 & 2, 3 & 8, and 4 & 7   b. angles
    1 & 7, 8 & 6, and 2 & 4   c. angles
    3 & 4, 7 & 8, and 1 & 6   d. angles
   1 & 7, 2 & 4, and 6 & 7

27. Find the value of x. The diagram is not to scale.

    a. 40 b. 20 c. 140 d. 160

28. Which lines are parallel if $m\angle 1 + m\angle 2 = 180$?
    Justify your answer.
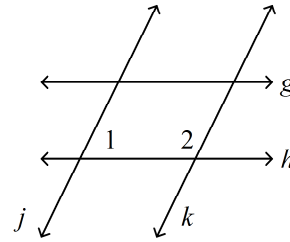
    a. $j \parallel k$, by the Converse of the Same-Side
    Interior Angles Theorem   b. $j \parallel k$, by the
    Converse of the Alternate Interior Angles Theorem
    c. $g \parallel h$, by the Converse of the Alternate Interior
    Angles Theorem   d. $g \parallel h$, by the Converse of the
    Same-Side Interior Angles Theorem

29. Which lines are parallel if $m\angle 3 = m\angle 6$? Justify
    your answer.
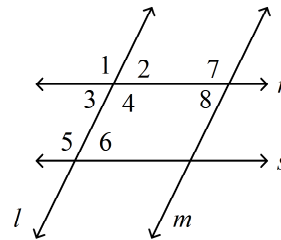
    a. $r \parallel s$, by the Converse of the Same-Side
    Interior Angles Theorem   b. $r \parallel s$, by the
    Converse of the Alternate Interior Angles Theorem
    c. $l \parallel m$, by the Converse of the Alternate Interior
    Angles Theorem   d. $l \parallel m$, by the Converse of the
    Same-Side Interior Angles Theorem

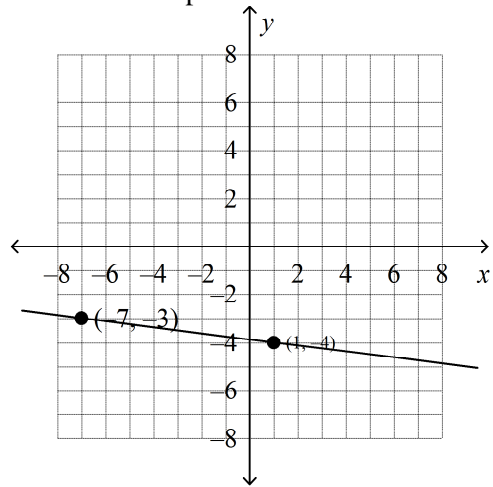30. Find the value of *k*. The diagram is not to scale.
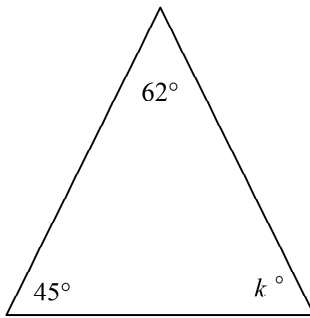
  a. 17 b. 73 c. 118 d. 107

31. Find the value of *x*. The diagram is not to scale.

  a. 33 b. 162 c. 147 d. 75

Use the number line to find the measure.
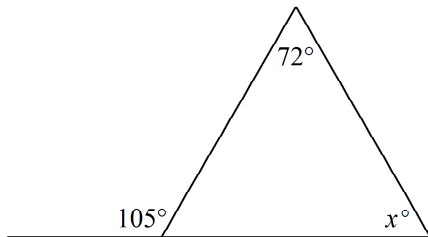
34. *PH*
 a. 4.5 b. 8 c. 9 d. –0.5
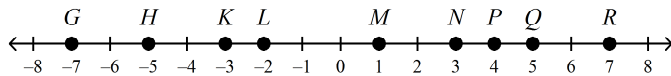
32. What is the slope of the line shown?

 a. $-\dfrac{1}{9}$ b. 0 c. –8 d. $-\dfrac{1}{8}$

33. Find the value of the variable and *GH* if *H* is between *G* and *I*.

$GI = 5b + 1, HI = 4b - 5, HI = 7$

 a. $b = 1.2, GH = 6.8$ b. $b = 1.22, GH = 7.11$
 c. $b = 3, GH = 9$ d. $b = 3, GH = 16$

Use the Distance Formula to find the distance between each pair of points.

35.
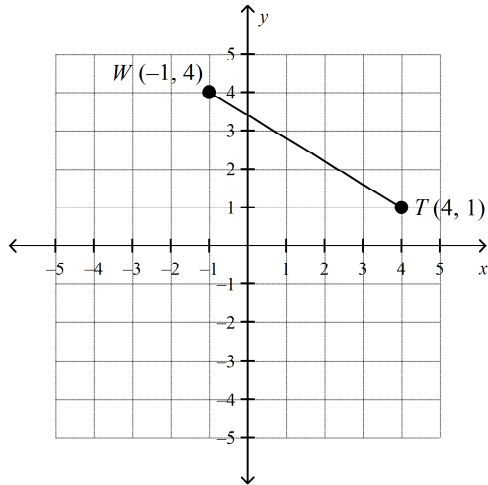
a. $\sqrt{50}$ b. $\sqrt{34}$ c. 6 d. 4

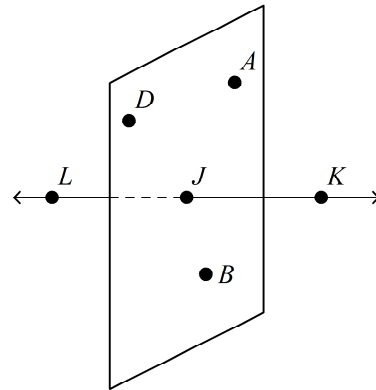*In the figure, $\overrightarrow{GK}$ bisects $\angle FGH$.*
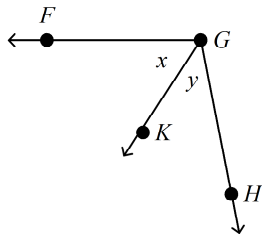
36. If $m\angle FGK = 3v - 4$ and $m\angle KGH = 2v + 7$, find x.
    a. 33 b. 58 c. 11 d. 29

37. If $m\angle FGK = 7w + 3$ and $m\angle FGH = 104$, find w.
    a. 7 b. 14.43 c. 52 d. 3.5

38. What are the names of three collinear points?
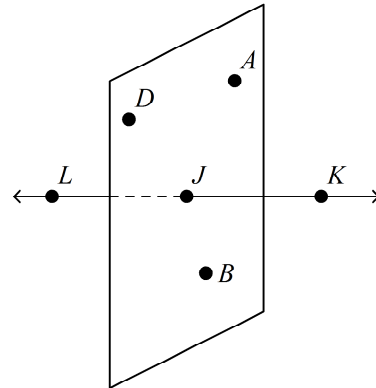
a. Points D, J, and K are collinear. b. Points A, J, and B are collinear. c. Points D, J, and B are collinear. d. Points L, J, and K are collinear.

39. What are the names of four coplanar points?

a. Points D, A, K, and J are coplanar. b. Points D, A, B, and J are coplanar. c. Points L, K, D, and B are coplanar. d. Points D, A, L, and J are coplanar.
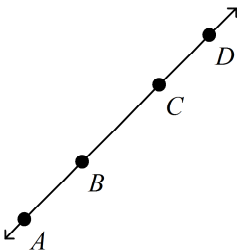
40. What are the names of three planes that contain point *B*?
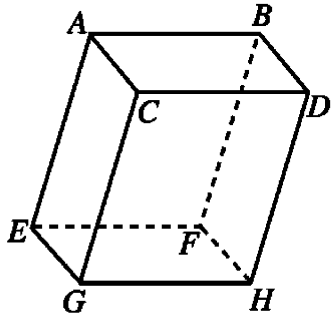
a. planes *ABDC*, *EFGH*, and *BDGE*   b. planes *ABDC*, *ABFE*, and *BDGE*   c. planes *CDHG*, *ABFE*, and *BDGE*   d. planes *ABDC*, *ABFE*, and *CDHG*

41. Name the ray in the figure.

a. $\overrightarrow{BA}$ b. $\overleftrightarrow{AB}$ c. $\overline{BA}$ d. $\overrightarrow{AB}$

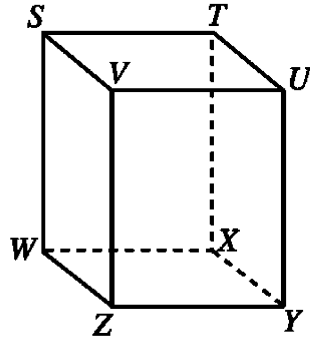42. What is the name of the ray that is opposite $\overrightarrow{BA}$?

a. $\overrightarrow{BD}$ b. $\overrightarrow{BA}$ c. $\overrightarrow{CA}$ d. $\overrightarrow{DA}$

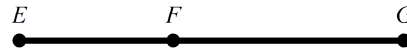43. Name the intersection of plane *BPQ* and plane *CPQ*.

a. $\overleftrightarrow{PQ}$ b. $\overleftrightarrow{BP}$ c. $\overleftrightarrow{CQ}$ d. The planes need not intersect.

44. What is the intersection of plane *TUYX* and plane *VUYZ*?
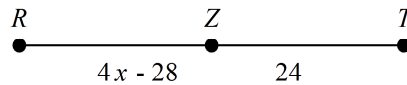

a. $\overleftrightarrow{UY}$ b. $\overleftrightarrow{SW}$ c. $\overleftrightarrow{TX}$ d. $\overleftrightarrow{VZ}$

45. If $EF = 5x + 15$, $FG = 53$, and $EG = 143$, find the value of *x*. The drawing is not to scale.
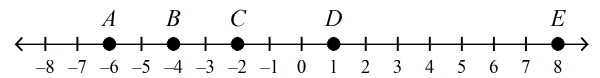

a. $x = 7$ b. $x = 75$ c. $x = 15$ d. $x = 17$

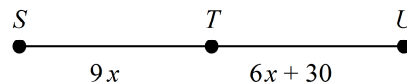46. If *Z* is the midpoint of $\overline{RT}$, what are *x*, *RZ*, and *RT*?

a. $x = 13$, $RZ = 48$, and $RT = 24$ b. $x = 11$, $RZ = 16$, and $RT = 32$ c. $x = 13$, $RZ = 24$, and $RT = 48$ d. $x = 15$, $RZ = 24$, and $RT = 48$
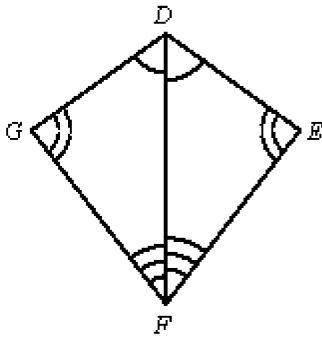
47. Which point is the midpoint of $\overline{AE}$?

a. *D*   b. *B*   c. not *B*, *C*, or *D*   d. *C*

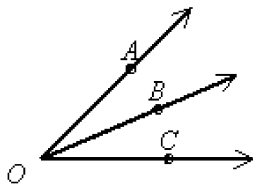48. If *T* is the midpoint of $\overline{SU}$, what are *ST*, *TU*, and *SU*?

a. $ST = 10$, $TU = 90$, and $SU = 180$ b. $ST = 110$, $TU = 110$, and $SU = 220$ c. $ST = 18$, $TU = 18$, and $SU = 36$ d. $ST = 90$, $TU = 90$, and $SU = 180$

49. Complete the statement.
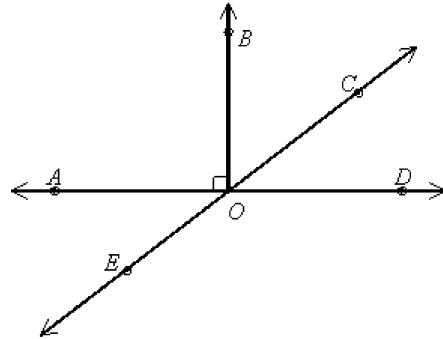   The drawing is not to scale.

    If $m\angle GDF = 54°$, then $m\angle EDF = \underline{\ ?\ }$.
    a. 27°   b. 54°   c. 63°   d. none of these

50. If $m\angle AOC = 85°$, $m\angle BOC = 2x + 10$, and
    $m\angle AOB = 4x - 15$, find the degree measure of
    $\angle BOC$ and $\angle AOB$. The diagram is not to scale.
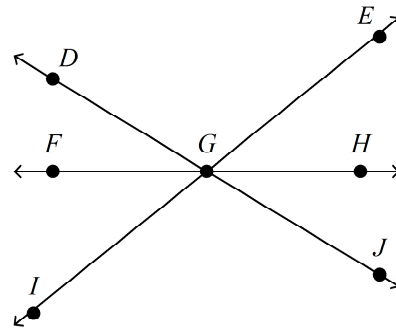

    a. $m\angle BOC = 30°$; $m\angle AOB = 55°$
    b. $m\angle BOC = 40°$; $m\angle AOB = 45°$
    c. $m\angle BOC = 45°$; $m\angle AOB = 40°$
    d. $m\angle BOC = 55°$; $m\angle AOB = 30°$

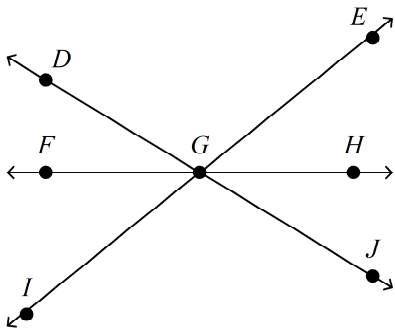51. Name an angle complementary to $\angle COD$.

    a. $\angle EOD$ b. $\angle AOC$ c. $\angle EOA$ d. $\angle COB$

52. Name an angle vertical to $\angle DGE$.

    a. $\angle DGI$ b. $\angle EGJ$ c. $\angle JGI$ d. $\angle EGH$

53. Name an angle adjacent to ∠*DGE*.

57. Which point is the midpoint of $\overline{AE}$?

a. 1.5   b. –1   c. 2.5   d. 0.5

58. Find the coordinates of the midpoint of the segment whose endpoints are *H*(8, 2) and *K*(6, 10).
a. (7, 6)   b. (1, 4)   c. (14, 12)   d. (2, 8)

59. Find the distance between points *P*(8, 2) and *Q*(3, 8) to the nearest tenth.
a. 11   b. 7.8   c. 61   d. 14.9

a. ∠*FGI*   b. ∠*EGH*   c. ∠*HGJ*   d. ∠*JGI*

54. In the figure shown, *m*∠*AED* = 120. Which of the following statements is false?
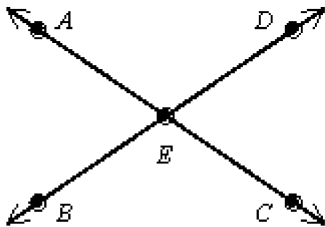
Not drawn to scale
a. *m*∠*AEB* = 60   b. ∠*BEC* and ∠*CED* are adjacent angles.   c. *m*∠*BEC* = 120   d. ∠*AED* and ∠*BEC* are adjacent angles.

55. ∠*DFG* and ∠*JKL* are complementary angles. *m*∠*DFG* = *x* + 5, and *m*∠*JKL* = *x* − 9. Find the measure of each angle.
a. ∠*DFG* = 47, ∠*JKL* = 53   b. ∠*DFG* = 47, ∠*JKL* = 43   c. ∠*DFG* = 52, ∠*JKL* = 48
d. ∠*DFG* = 52, ∠*JKL* = 38

56. ∠1 and ∠2 are a linear pair. *m*∠1 = *x* − 39, and *m*∠2 = *x* + 61. Find the measure of each angle.
a. ∠1 = 79, ∠2 = 101   b. ∠1 = 40, ∠2 = 140
c. ∠1 = 40, ∠2 = 150   d. ∠1 = 79, ∠2 = 111

Refer to the figure below.
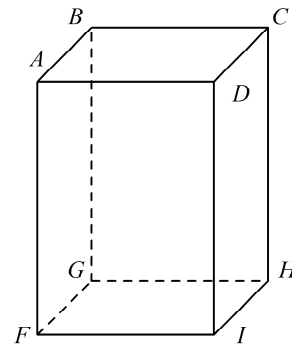
60. Name all segments parallel to $\overline{GF}$.
a. $\overline{BC}, \overline{AD}, \overline{HI}$ b. $\overline{AB}, \overline{CD}, \overline{HI}$ c. $\overline{CD}, \overline{HI}$
d. $\overline{AB}, \overline{CD}$

61. Name all segments skew to $\overline{BC}$.
a. $\overline{FI}, \overline{AD}, \overline{FA}, \overline{DI}$ b. $\overline{FG}, \overline{GH}, \overline{HI}, \overline{FI}$
c. $\overline{CD}, \overline{AB}, \overline{BG}, \overline{CH}$ d. $\overline{GF}, \overline{HI}, \overline{DI}, \overline{AF}$
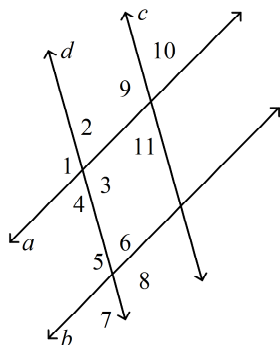
62. Name all segments parallel to $\overline{GH}$.
a. $\overline{BG}, \overline{CH}, \overline{FG}, \overline{HI}$ b. $\overline{CD}, \overline{BA}, \overline{AF}, \overline{DI}$
c. $\overline{CD}, \overline{AB}, \overline{HI}$ d. $\overline{BC}, \overline{AD}, \overline{FI}$

Determine whether $\overleftrightarrow{WX}$ and $\overleftrightarrow{YZ}$ are parallel, perpendicular, or neither.
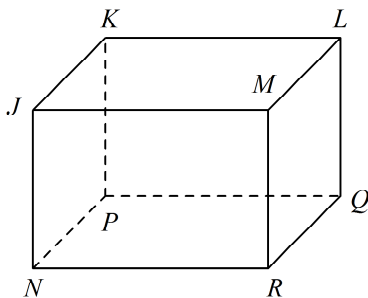
63. $W(0, -3), X(-1, 5), Y(2, 5), Z(-1, 2)$

   a. parallel   b. perpendicular   c. neither

   Given the following information, determine which lines, if any, are parallel. State the postulate or theorem that justifies your answer.

64. $\angle 11 \cong \angle 2$

   a. $c \parallel d$; congruent corresponding angles   b. $a \parallel b$; congruent corresponding angles   c. $c \parallel d$; congruent alternate interior angles   d. $a \parallel b$; congruent alternate interior angles

65. What four segments are parallel to plane *PNRQ*?
   a. segments *JK, KL, ML,* and *JM*   b. segments *JN, MR, LQ,* and *KP*   c. segments *NP, RQ, PQ,* and *JM*   d. segments *KP, LQ, JK,* and *ML*

11

Short Answer

66. Find the measure of each interior and exterior angle. The diagram is not to scale.