1) Ray PR is shown in which sketch?

a)  

b)  

c)  

d)  

2) If RS = 32.2 and QS = 62.8, find QR.

a)  95  

b)  32.2  

c)  30.6  

d)  20.6  

3) Use the Segment Addition Postulate to solve for p.

FE = 4p + 20  
EG = 5p + 16  
FG = 45 

a)  p = 1  

b)  p = 4  

c)  p = 5  

d)  p = 6  

4) Find the distance between A(–6, 0) and B(–4, 4).

a)  116  

b)  \sqrt{20}  

c)  \sqrt{116}  

d)  20  

5) Find the midpoint of A(–6, 0) and B(–4, 4).

a)  (–1, 2)  

b)  (–5, 2)  

c)  (–8, –4)  

d)  (–2, 8)  

6) M is the midpoint of segment AB. Given the coordinates of A(2, –4) and M(4, 6), find the coordinates of B.

a)  (3, 1)  

b)  (6, 16)  

c)  (6, 8)  

d)  (6, 2)  

7) Which of the following angles measures 125°?

a)  

b)  

c)  

d)  

8) If $\angle JOL = 50^\circ$ and $\angle KOL = 27^\circ$, then what is the measure of $\angle JOK$?
   a) $25^\circ$  b) $23^\circ$  c) $28^\circ$  d) $20^\circ$

9) Given that $\angle GED=60^\circ$, $\angle GEF=2x + 7$ and $\angle DEF=7x - 1$, find $\angle GEF$ and $\angle DEF$.
   a) $\angle GEF = 41^\circ$ and $\angle DEF = 19^\circ$
   b) $\angle GEF = 47^\circ$ and $\angle DEF = 13^\circ$
   c) $\angle GEF = 13^\circ$ and $\angle DEF = 47^\circ$
   d) $\angle GEF = 19^\circ$ and $\angle DEF = 41^\circ$

10) In the figure below, $\angle AED = 128^\circ$. Which of the following statements is false?
    a) $\angle BEC = 128^\circ$
    b) $\angle AEB$ and $\angle DEC$ are congruent
    c) $\angle BEC$ and $\angle CED$ are vertical angles
    d) $\angle AEB = 52^\circ$

11) $\angle 1$ and $\angle 2$ are ______.
    a) a linear pair
    b) complementary angles
    c) supplementary angles
    d) vertical angles

12) Find the measure of $\angle 1$.
    a) $42^\circ$
    b) $48^\circ$
    c) $58^\circ$
    d) $138^\circ$

13) Solve for $x$.
    a) 0
    b) 1
    c) 2
    d) 5

14) Solve for $x$.
    a) 1
    b) 2
    c) 3
    d) 6
15) Name an angle that is adjacent to $\angle BOC$
   a) $\angle DOE$
   b) $\angle AOE$
   c) $\angle DOB$
   d) $\angle BOA$

16) Using the diagram above, name an angle that is complementary to $\angle COD$.
   a) $\angle AOE$  b) $\angle BOC$  c) $\angle DOE$  d) $\angle AOC$

17) Rewrite the statement in if-then form: **Vertical angles are congruent.**
   a) If angles are congruent then they are vertical angles.
   b) If vertical angles are congruent then they can be measured.
   c) Angles are vertical angles if and only if they are congruent.
   d) **If angles are vertical angles then they are congruent.**

18) What is the converse of the statement, “If it rains then I carry my umbrella.”?
   a) “If it does not rain, then I do not carry my umbrella.”
   b) “If I do not carry my umbrella, then it does not rain.”
   c) “If I do not carry my umbrella, then I will get wet.”
   d) **“If I carry my umbrella, then it rains.”**

19) “If I get a chance then I will succeed.” In this conditional statement, the underlined portion is
   a) the hypothesis  b) the argument  c) the conclusion  d) the converse

20) What is the inverse of the statement, “If two lines are parallel, then they do not intersect.”?
   a) **“If two lines are not parallel then they intersect.’**
   b) “If two lines intersect then they are not parallel.”
   c) “If two lines do not intersect then they may be skew.”
   d) “If two lines do not intersect then they are not parallel.”

21) Which of the following statements is **false**?
   a) Three non-collinear points determine a plane.
   b) **Any three points are collinear.**
   c) A line contains at least two points.
   d) Through any two distinct points there exists exactly one line.

22) State a counterexample to the following statement: “If $x^2 = 25$, then $x = 5$.”
   a) $x = 5$
   b) **$x = -5$**
   c) $x^2 = 25$
   d) $x^2 = 100$
23) The figure at right represents which of the following statements?
   a) two perpendicular rays  
   b) two perpendicular lines  
   c) a straight angle  
   d) $AB = AC$

24) Identify this property of congruence: $\overline{CD} \cong \overline{CD}$
   a) Transitive  
   b) Reflexive  
   c) Symmetric  
   d) Substitution

25) There’s no reason to stress, this is only a test.
    To get you on your way, I’ll give you this one, it’s A!

26) In the cube shown at right, $\overline{AD}$ and $\overline{HG}$ are called _____
   a) parallel lines  
   b) perpendicular lines  
   c) intersecting lines  
   d) skew lines

27) In the figure shown, $\angle 1$ and $\angle 2$ are ___
   a) same-side interior angles  
   b) corresponding angles  
   c) alternate interior angles  
   d) alternate exterior angles

28) In the figure, $\angle 6$ and $\angle 3$ are ____
   A) corresponding angles  
   B) alternate interior angles  
   C) alternate exterior angles  
   D) consecutive interior angles

29) In the figure above, $\angle 6$ and $\angle 2$ are ____
   a) alternate interior angles  
   b) alternate exterior angles  
   c) corresponding angles  
   d) same-side interior angles

30) Find $m\angle 1$, given that $PQ \parallel RS$
   a) $11^\circ$  
   b) $79^\circ$  
   c) $91^\circ$  
   d) $101^\circ$
31) In the figure, \( l \parallel n \) and \( r \) is a transversal.
Which of the following is not necessarily true?
   a) \( \angle 2 \cong \angle 6 \)
   b) \( \angle 8 \cong \angle 2 \)
   c) \( \angle 7 \cong \angle 4 \)
   d) \( \angle 5 \cong \angle 3 \)

32) In the figure shown, \( \overline{HC} \parallel \overline{GD} \), and \( m\angle ABC = 108^\circ \).
Which of the following statements is false?
   a) \( m\angle DEF = 72^\circ \)
   b) \( \angle ABH \) and \( \angle AEG \) are alternate exterior angles
   c) \( \angle HBF \) and \( \angle AED \) are alternate interior angles
   d) \( m\angle GEF = 108^\circ \)

33) Find the slope of the line passing through the points (1, 6) and (6, 5).
   a) \( 7 \)
   b) \( -\frac{1}{7} \)
   c) \( \frac{11}{5} \)
   d) \( -7 \)

34) A line parallel to \( y = \frac{2}{3}x - 7 \) is:
   a) \( y = -\frac{2}{3}x - 7 \)
   b) \( y = -\frac{3}{2}x + 7 \)
   c) \( y = \frac{3}{2}x + 2 \)
   d) \( y = \frac{2}{3}x + 1 \)

35) Which describes the relationship between the lines with equations
    \(-7x + 6y = 4\) and \(6x + 7y = 0\)?
   a) parallel
   b) same line
   c) perpendicular
   d) neither parallel nor perpendicular

36) Classify \( \triangle NOP \).
   a) Equilateral
   b) Isosceles
   c) Scalene
   d) none of these

37) Name an obtuse triangle in the diagram at right.
   a) \( \triangle ADB \)
   b) \( \triangle BDC \)
   c) \( \triangle ABC \)
   d) none of these

38) Find the value of \( x \).
   a) \( 80^\circ \)
   b) \( 100^\circ \)
   c) \( 160^\circ \)
   d) \( 170^\circ \)
39) Solve for $x$.
   a) 45  
   b) 55  
   c) 90  
   d) 145

40) Which figures appear to be congruent?
   a) 3 and 4
   b) 1, 2, and 4
   c) 2 and 5
   d) 1 and 4

41) If $\triangle ABC \cong \triangle XYZ$, then $AC \cong _____$.
   a) XY  
   b) YZ  
   c) XZ  
   d) AX

42) If $\triangle JKL \cong \triangle STU$, JK = 10 feet, $m\angle K = 59^\circ$, and $m\angle U = 21^\circ$, which of the following is false?
   a) JL = SU  
   b) KL = TU  
   c) $m\angle S = 100^\circ$  
   d) $\angle K \cong \angle S$

43) In the diagram, $\angle B \cong \angle E$ and $\angle C \cong \angle F$. Find the value of $x$.
   a) 25  
   b) 35  
   c) 50  
   d) 75

44) What must be true for $\triangle ABC \cong \triangle EDC$ by SAS?
   a) $\angle B \cong \angle D$  
   b) $\overline{AB} \cong \overline{DE}$  
   c) $\overline{AC} \cong \overline{CE}$  
   d) $\angle A \cong \angle E$

45) Which of the following statements must be true, if $AD \perp BC$ and $AB = AC$?
   a) $\triangle ABD \cong \triangle ACD$ by SSS
   b) $\triangle ABD \cong \triangle ACD$ by SAS
   c) $\triangle ABD \cong \triangle ACD$ by HL
   d) There are no congruent triangles

46) Refer to the figure at right. $\triangle ABC \cong _____$
   a) $\triangle EDC$  
   b) $\triangle EDA$
   c) $\triangle ACE$
   d) $\triangle CDE$
47) Using just the information shown in the diagram, which postulate or theorem can be used to prove that \( \triangle ABC \cong \triangle EDC \)?
   a) SSA
   b) SSS
   c) AAS
   d) SAS

48) What is the measure of each base angle of an isosceles triangle if its vertex angle measures 32° and its 2 congruent sides measure 17 inches?
   a) 32°
   b) 58°
   c) 74°
   d) 148°

49) In \( \triangle ABC \), if \( AB \cong BC \) and \( m \angle A = 39° \), then \( m \angle C = \) ______.
   a) 39°
   b) 51°
   c) 102°
   d) 141°

50) Now you’ve come half-way, and I want you to have a good day,
    So bubble the B, ‘cause this one’s on me!

51) Find the values of \( x \) and \( y \).
   a) \( x = 70° \) and \( y = 50° \)
   b) \( x = 40° \) and \( y = 110° \)
   c) \( x = 40° \) and \( y = 70° \)
   d) \( x = 70° \) and \( y = 110° \)

52) Identify the longest side of the triangle.
   a) \( AB \)
   b) \( AC \)
   c) \( BC \)
   d) All the sides are the same length

53) Arrange the angles of the triangle in order, from largest to smallest.
   a) \( \angle P, \angle Q, \angle R \)
   b) \( \angle P, \angle R, \angle Q \)
   c) \( \angle Q, \angle R, \angle P \)
   d) \( \angle Q, \angle P, \angle R \)

54) The longest side in the figure is ______
   a) \( NM \)
   b) \( ML \)
   c) \( LN \)
   d) \( MP \)

55) Two sides of a triangle have lengths 12 and 27.
    The length of the third side must be greater than ____ and less than ____.
   a) 14, 40
   b) 15, 39
   c) 11, 28
   d) 12, 27
56) Which side lengths allow you to construct a triangle?
   a)  7, 2, and 2               b)  2, 3, and 8               c)  1, 4, and 9               d)  6, 8, and 10

57) \( \overline{MN} \) is a midsegment of \( \triangle ABC \). If BC = 28, find the length of \( \overline{MN} \).
   a)  7               b)  14               c)  28               d)  56

58) In the figure shown, \( m\angle AED = 110^\circ \). Which statement is **false**?
   a)  \( m\angle AEB = 80^\circ \)
   b)  \( \angle AEB \) and \( \angle DEC \) are vertical angles
   c)  \( \angle BEC \) and \( \angle CED \) are adjacent angles
   d)  \( m\angle BEC = 110^\circ \)

59) If line \( a \) is parallel to line \( b \), what is \( m\angle 1 \)?
   a)  40°               b)  50°               c)  90°               d)  140°

60) Lines \( \overline{AB} \) and \( \overline{CD} \) intersect at \( P \). \( \overline{PR} \) is perpendicular to \( \overline{AB} \) and \( m\angle APD = 170^\circ \).
    What is the measure of \( \angle DPB \)?
   a)  10°               b)  20°               c)  30°               d)  40°

61) A ladder is leaning against a house at an angle of 38°, as shown in the diagram.
    What is the measure of the angle \( x \), that the ladder makes with the ground?
   a)  38°               b)  42°               c)  52°               d)  142°

62) Line \( a \) is parallel to line \( b \) if:
   a)  \( m\angle 4 = m\angle 2 \)               b)  \( m\angle 3 = m\angle 5 \)
   c)  \( m\angle 4 = m\angle 5 \)               d)  \( m\angle 3 = m\angle 2 \)
63) \( \triangle ABC \) is a right triangle with right angle at \( C \). Which are the possible measures of \( \angle A \) and \( \angle B \)?

a) 48° and 50°

b) 38° and 32°

c) \( \boxed{52^\circ \text{ and } 38^\circ} \)

d) 52° and 128°

64) Which conclusion follows logically from the true statements?

“If negotiations fail, then the baseball strike will not end.”

“If the baseball strike does not end, then the World Series will not be played.”

a) If the baseball strike ends, the World Series will be played.

b) If negotiations do not fail, the baseball strike will end.

c) \textbf{If negotiations fail, the World Series will not be played.}

d) If negotiations fail, the World Series will be played.

65) Given that \( \overline{AD} \cong \overline{BC} \) and \( \overline{AC} \cong \overline{BD} \), which could be used to prove that \( \triangle DCA \cong \triangle CDB \)?

a) SSS

b) SAS

c) ASA

d) AAS

66) On the shores of a river, surveyors marked locations A, B, and C. \( \angle ACB = 70^\circ \) and \( \angle ABC = 65^\circ \). Which lists the distances between these locations in order, least to greatest?

a) \( AB, BC, AC \)

b) \( BC, AB, AC \)

c) \( BC, AC, AB \)

d) \( AC, AB, BC \)

67) The figure has angle measures as shown. What is \( \angle BCD \)?

a) 120°

b) 80°

c) \( \boxed{60^\circ} \)

d) 30°

68) What is \( \angle 3 \)?

a) 65°

b) 75°

c) \( \boxed{85^\circ} \)

d) 90°

69) Which of the following could be the lengths of the sides of \( \triangle ABC \)?

a) \( AB = 12, BC = 15, AC = 2 \)

b) \( AB = 9, BC = 15, CA = 4 \)

c) \( AB = 150, BC = 100, CA = 50 \)

d) \( \boxed{AB = 10, BC = 8, AC = 12} \)
70) To find the contrapositive of a conditional statement you should:
   a) Find the inverse of the converse of the original statement.
   b) Find the converse of the inverse of the original statement.
   c) Negate the hypothesis and conclusion of the converse of the original statement.
   d) All of the above.

71) Three lookout towers are located at points A, B, and C on a section of the national forest shown in the diagram. Which of the following is true concerning \( \triangle ABC \) formed by the towers?
   a) \( m\angle A \) is greatest
   b) \( m\angle C \) is greatest
   c) \( m\angle A \) is least
   d) \( m\angle C \) is least

72) What value of \( x \) will make lines \( l \) and \( m \) parallel?
   a) 25
   b) 30
   c) 40
   d) 60

73) In the figure, \( m\angle CAD \) is twice \( m\angle CAB \). What is \( m\angle CAB \)?
   a) 120°
   b) 60°
   c) 45°
   d) 30°

74) Triangle XYZ is a right triangle with the right angle at Z. Which are possible measures for angle X and angle Y?
   a) 40° and 42°
   b) 44° and 46°
   c) 48° and 50°
   d) 52° and 54°

75) You're three-fourths done! Hey, this is almost fun! This question is free, the answer is C.
Questions 76-90: True/False. For the following questions, bubble “a” for true and “b” for false.

76) It is possible to have a triangle with side lengths 7, 7, and 9.  
   a) True  
   b) False

77) Corresponding parts of congruent triangles are equal in measure.  
   a) True  
   b) False

78) Coplanar points are collinear.  
   a) True  
   b) False

79) Collinear points are coplanar.  
   a) True  
   b) False

80) SSA is a method to prove triangle congruency.  
   a) True  
   b) False

81) When two planes intersect, they form a line.  
   a) True  
   b) False

82) Equilateral triangles are equiangular.  
   a) True  
   b) False

83) Skew lines are coplanar.  
   a) True  
   b) False

84) If two lines are parallel, they have the same slope.  
   a) True  
   b) False

85) A right triangle can have up to two right angles.  
   a) True  
   b) False

86) In a right triangle, the hypotenuse is adjacent to the right angle.  
   a) True  
   b) False

87) The slope of a horizontal line is zero.  
   a) True  
   b) False

88) The AAA method is used to prove that triangles are congruent.  
   a) True  
   b) False

89) A scalene triangle never has congruent sides.  
   a) True  
   b) False

90) The Symmetric Property states an object is equal to itself (ex. b = b).  
   a) True  
   b) False

91. Simplify the following ratio as much as possible: \( \frac{8 \text{ in}}{2 \text{ ft}} \)  
   a) \( \frac{4}{1} \)  
   b) \( \frac{4 \text{ in}}{1 \text{ ft}} \)  
   c) \( \frac{8}{24} \)  
   d) \( \frac{1}{3} \)

92) Solve the proportion: \( \frac{x+2}{10} = \frac{1}{2} \)  
   a) \( \frac{3}{10} \)  
   b) 3  
   c) 4  
   d) 5

93) In the diagram \( \triangle ABC \sim \triangle XYZ \). Find YZ.  
   a) \( \frac{9}{2} \)  
   b) 2  
   c) 5  
   d) 8

94) Let \( p \) represent “Line AB and line BC are
perpendicular” and let \( q \) represent “\( \angle ABC \) is a right angle”. Which represents the contrapositive of “If line \( AB \) and line \( BC \) are perpendicular, then \( \angle ABC \) is a right angle”?

\[
\begin{align*}
\text{a) } & \quad q \to p \\
\text{b) } & \quad q \to \sim p \\
\text{c) } & \quad \sim q \to p \\
\text{d) } & \quad \sim q \to \sim p
\end{align*}
\]

95) Are the two triangles in this diagram similar? If so, give the similarity statement.

\[
\begin{align*}
\text{a) } & \quad \text{Yes, } \triangle ABC \sim \triangle CDE \\
\text{b) } & \quad \text{Yes, } \triangle ABD \sim \triangle EDC \\
\text{c) } & \quad \text{Yes, } \triangle ABD \sim \triangle ECD \\
\text{d) } & \quad \text{No, the triangles are not similar.}
\end{align*}
\]

96) In the diagram shown on the right, what is the length of \( AB \)?

\[
\begin{align*}
\text{a) } & \quad 4 \\
\text{b) } & \quad 3/2 \\
\text{c) } & \quad 8/3 \\
\text{d) } & \quad 16
\end{align*}
\]

97) If two sides of a triangle have lengths 7 and 11, which is a possible length for the third side of the triangle?

\[
\begin{align*}
\text{a) } & \quad 18 \\
\text{b) } & \quad 5 \\
\text{c) } & \quad 4 \\
\text{d) } & \quad 2
\end{align*}
\]

98) The coordinates of the midpoint of line segment \( CD \) are \((4, -5)\) and the coordinates of \( C \) are \((8, -8)\). What are the coordinates of \( D \)?

\[
\begin{align*}
\text{a) } & \quad (-2,0) \\
\text{b) } & \quad (0,0) \\
\text{c) } & \quad (0,-2) \\
\text{d) } & \quad (2,-2)
\end{align*}
\]

99) If two triangles have one pair of congruent angles and if the lengths of the corresponding adjacent sides are proportional, then the triangles are:

\[
\begin{align*}
\text{a) } & \quad \text{equal} \\
\text{b) } & \quad \text{congruent} \\
\text{c) } & \quad \text{similar} \\
\text{d) } & \quad \text{obtuse}
\end{align*}
\]