Geometry Rules

**April 2017**

7. In parallelogram ABCD below AC(line) is a diagonal, the measure of (angle)ABC is 40°, and the measure of (angle)ACD is 57°. What is the measure of (angle)CAD?

1. 40°
2. 57°
3. 77°
4. 83°
5. 97°

[PICTURE]

60. Ray (ray)PK bisects (angle)LPM, the measure of (angle)LPM is 11x°, and the measure of (angle)LPK is (4x + 18)°. What is the measure of (angle)KPM?

1. 12°
2. 28 (2/7)°
3. 42°
4. 61 (1/5)°
5. 66°

**June 2017**

6. in triangle(ACD) below, B is on line(AC), E is on line(AD), the measure of angle(CAD) is 28°, and line(AD) is perpendicular to both line(BE) and line(CD). What is the measure of angle(CBE)?

1. 104°
2. 118°
3. 124°
4. 146°
5. 152°

[PICTURE]

13. In the figure shown below, E and G lie on (line)AC, D and F lie on (line)AB , (line)DE and (line)FG are parallel to the (line)BC, and the given lengths are in feet. What is the length of (line)AC, in feet?

1. 9
2. 18
3. 21
4. 30
5. 36

[PICTURE]

46. in the figure below, line *m* is perpendicular to line *n*, and both lines intersect line q at the same point. The measure of (angle)1 is (3x – 10)°, and the measure of (angle)2 is (2x+10)°. What is the measure of (angle)3?

1. 36°
2. 40°
3. 44°
4. 45°
5. 54°

[PICTURE]

**April 2016**

22. As shown below, A, B, C, and D are collinear, with B between A and C and with C between B and D. Given AC = BD = 12 cm and given BC = 3 cm, what is AD, in centimeters?

1. 9
2. 15
3. 18
4. 21
5. 27

[PICTURE]

24. In Middletown, Main Street and Market Street are parallel to each other. Patrick Street intersects Market Street to form a 76° angle at the northeast corner, as shown in the figure below. What is the measure of the angle formed at the southeast corner of Main Street and Patrick Street? (Note: Each street is straight and has the same uniform width.)

1. 76°
2. 90°
3. 104°
4. 142°
5. 152°

[PICTURE]

37. In the figure shown below, △ABC ~ △DEF, sides AB (line on top) and BC (line on top) are each 7.2cm long, side DE (line on top) is 10.8 cm long, and the measure of (angle) E is 42º. What is the measure of (angle) C?

1. 42º
2. 46º
3. 60º
4. 63º
5. 69º

[PICTURE]

52. From point A outside a circle and in the same plane as the circle, 2 rays are drawn tangent to the circle with the points of tangency labeled B and C, respectively. Segment (line)BC is then drawn to form (triangle)ABC. If (angle)A measures 70°, what is the measure of (angle)ABC?

1. 70°
2. 55°
3. 40°
4. 35°
5. Cannot be determined from the given information

53. Graphed in the standard (x,y) coordinate plane below is an ellipse. The center of the ellipse is (0,0), and points (-5,0), (0,3), (5,0), (0,-3), A(3,a), and B(3,b) lie on the ellipse. What is the distance, in coordinate units, from A to B?

1. 2.4
2. 3
3. 4
4. 4.8
5. 6

[PICTURE]

60. As shown in the figure below, (line)AC and (line)BD intersect at O. Given that 180° < x° < 360° and that x = 4y, what is the value of y?

1. 54
2. 60
3. 67.5
4. 72
5. 75

[PICTURE]

**June 2016**

22. In the figure below, 5 angle measures are given. The angle marked with a measure of y° is an exterior angle. What is the value of y?

1. 22.5
2. 45
3. 80
4. 100
5. 145

[PICTURE]

58. In the figure below, (line)BC is parallel to (line)AD, E is the midpoint of (line)AB, F is the midpoint of (line)CD, G is the midpoint of (line)AE, and H is the midpoint of (line)FD. The lengths marked are in inches. What is the length of (line)GH, in inches?

1. 31
2. 31 (1/2)
3. 37
4. 38
5. 43 (1/2)

[PICTURE]

60. Distinct points A, B, C, and D are collinear, and B is between A and C. For D to be between A and C such that AD + DB + BC = AC, which of statements I-IV below *must* be true?

(Note: If B is between A and C, then AB + BC = AC.) I. AD = DB II. AD = BC III. B is between D and C IV. D is between B and C

1. I only
2. III only
3. I and III only
4. II and IV only
5. None of the statements must be true.

**April 2015**

13. In the figure below, G is the center of the circle, (line)LK is a diameter, H lies on the circle J lies outside the circle on (line)LK, and (line)JM is tangent to the circle at M. Which of the following angles or minor arcs has the greatest degree measure? (arc)LM

1. (arc)MK
2. (angle)JMG
3. (angle)LHK
4. (angle) MJL

[PICTURE]

33. In a plane, the distinct lines (line)AB and (line)CD intersect at A, where A is between C and D. The measure of (angle)BAC is 54°. What is the measure of (angle)BAD?

1. 54°
2. (54 + 54)°
3. (90 – 54)°
4. (90 + 54)°
5. (180 – 54)°

**June 2015**

34. In the figure shown below, ABCD is a rectangle, EFGH is a square, and (line)CD is the diameter of a semicircle. Points K is the midpoint of (line)CD. Point J is the midpoint of both (line)AB and (line)EF. Points E and F lie on (line)AB. The 3 given lengths are in meters. What is the length, in meters, of (line)JD?

1. 13
2. 15.6
3. 17
4. (rad)44
5. (rad)244

[PICTURE]

**December 2015**

20. In the figure below, parallel lines (arrows <->)AB and (arrows<->)CD are cut by transversals (arrows<->AC) and (arrows<->)BD that intersects at E. Two angle measures are given. What is the measure of (angle)ABD?

1. 110°
2. 112°
3. 138°
4. 144°
5. 146°

\*\*picture\*\*

36. The measures of 4 interior angles of a pentagon are 70°, 100°, 110°, and 135°, respectively. What is the measure of the 5th interior angle?

1. 35°
2. 55°
3. 83°
4. 108°
5. 125°