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? [PICTURE]

A. 40°

B. 57°

C. 77°

D. 83°

E. 97°

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?

F. 12°

G. 28 (2/7)°

H. 42°

J. 61 (1/5)°

K. 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)?

[PICTURE]

F. 104°

G. 118°

H. 124°

J. 146°

K. 152°

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? [PICTURE]

A. 9

B. 18

C. 21

D. 30

E. 36

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? [PICTURE]

F. 36°

G. 40°

H. 44°

J. 45°

K. 54°

**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? [PICTURE]

F. 9

G. 15

H. 18

J. 21

K. 27

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.) [PICTURE]

F. 76°

G. 90°

H. 104°

J. 142°

K. 152°

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? **[PICTURES]**

A. 42º

B. 46º

C. 60º

D. 63º

E. 69º

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?

F. 70°

G. 55°

H. 40°

J. 35°

K. 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? [PICTURE]

A. 2.4

B. 3

C. 4

D. 4.8

E. 6

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? [PICTURE]

F. 54

G. 60

H. 67.5

J. 72

K. 75

**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? [PICTURE]

F. 22.5

G. 45

H. 80

J. 100

K. 145

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? [PICTURE]

F. 31

G. 31 (1/2)

H. 37

J. 38

K. 43 (1/2)

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

**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? [PICTURE]

A. (arc)LM

B. (arc)MK

C. (angle)JMG

D. (angle)LHK

E. (angle) MJL

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?

A. 54°

B. (54 + 54)°

C. (90 – 54)°

D. (90 + 54)°

E. (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. [PICTURE]

What is the length, in meters, of (line)JD?

F. 13

G. 15.6

H. 17

J. (rad)44

K. (rad)244

**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?

\*\*picture\*\*

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

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?

F. 35°

G. 55°

H. 83°

J. 108°

K. 125°