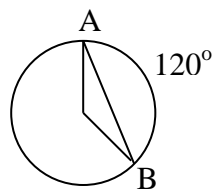


Honors Geometry Semester Exam Review Spring '19

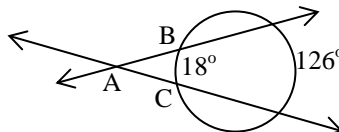
To earn full bonus credit on the final exam: all problems have work and be completed on a separate sheet of paper.

1. The radius of a circle is 6. If \widehat{AB} measures 120° , then the area of the region between \overline{AB} and \widehat{AB} is _____.



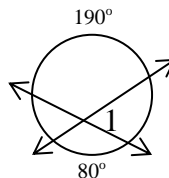
- A) 24π B) 12π C) $24\pi - 9\sqrt{3}$ D) $12\pi - 9\sqrt{3}$

2. Find the measure of $\angle BAC$.



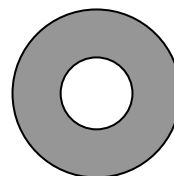
- A) 54° B) 108° C) 72° D) 36°

3. Find the measure of $\angle 1$.



- A) 135° B) 22.5° C) 45° D) 67.5°

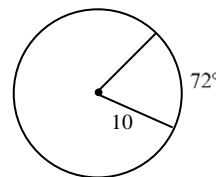
4. Find the area of the shaded region if the radius of the larger circle is 16 and the radius of the smaller circle is 9.



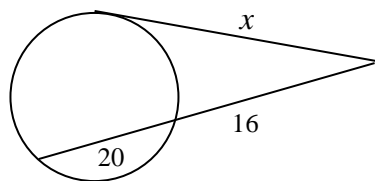
- A) 81π B) 175π C) 256π D) 337π

5. Find the area of the sector if the measure of the arc is 72° .

- A) 80π B) 4π
 C) 20π D) $\frac{5\pi}{18}$

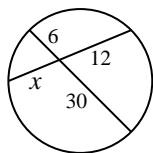


6. Find x .



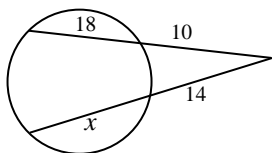
- A) 576 B) 288 C) 24 D) $8\sqrt{5}$

7. Find x .



- A) 15 B) 24 C) 3 D) 48

8. Find x .



- A) 20 B) 2 C) 16 D) 6

9. $\triangle ABC$ is equilateral with perimeter 30. Find the area of the triangle.

- A) $25\sqrt{3}$ B) $50\sqrt{3}$ C) $\frac{5\sqrt{3}}{2}$ D) $\frac{25\sqrt{3}}{4}$

10. Suppose the radius of a circle is 15 cm and the center is 9 cm from the midpoint of a chord. Find the length of the chord.

- A) 24 cm B) 12 cm C) 30 cm D) 17 cm

11. Write an equation for the circle with center $(5, -2)$ and a diameter of 4 units.

- A) $(x - 5)^2 + (y + 2)^2 = 4$ B) $(x + 5)^2 + (y + 2)^2 = 16$
C) $(x + 5)^2 + (y - 2)^2 = 2$ D) $(x - 5)^2 + (y - 2)^2 = 4$

12. Circle Q has a diameter of 6. Find the length of an arc whose central angle measures 40° .

- A) π B) $\frac{\pi}{3}$ C) $\frac{2\pi}{3}$ D) $\frac{16\pi}{3}$

13. RSTU is a rectangle with diagonal intersection X. If $SX = 10a - 15$ and $XU = a + 12$, find the value of RT.

- A) 3 B) 15 C) 30 D) 45

14. RSTU is a rectangle with diagonal intersection X. If $\angle TSX = 50^\circ$, find the measure of $\angle UTX$.

- A) 25° B) 40° C) 50° D) 100°

15. Diagonals are always congruent in a

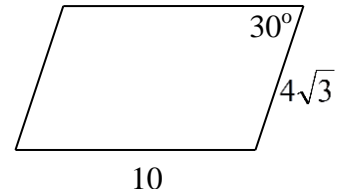
- A) trapezoid B) square C) rhombus D) parallelogram

16. In quadrilateral ABCD, $AB \cong BC \cong CD$, and $\angle A \cong \angle B$. What is the most accurate name for the quadrilateral?

- A) rhombus B) rectangle C) square D) isosceles trapezoid

17. Find the area of the given parallelogram.

- A) $40\sqrt{3}$ B) $20\sqrt{3}$ C) 40 D) 20



18. A square is inscribed in a circle with radius r . Find the area of the square in terms of the radius of the circle.

- A) $2r^2$ B) $r\sqrt{2}$ C) $r\sqrt{3}$ D) $\frac{r\sqrt{2}}{2}$

19. The measures of the bases of a trapezoid are 40 and 100. What is the measure of the median of the trapezoid?

- A) 30 B) 60 C) 70 D) 140

20. In circle Q, \overline{CD} is 18 cm long and 3 cm from the center. What is the length of the diameter?

- A) $18\sqrt{10}$ cm B) $6\sqrt{10}$ cm C) $3\sqrt{10}$ cm D) 90 cm

21. How many sides does a regular polygon have if the measure of one interior angle is 108° ?

- A) 8 B) 7 C) 6 D) 5

22. What is the sum of the measures of the interior angles of a convex octagon?

- A) 1260° B) 1440° C) 1080° D) 135°

23. The apothem of a regular hexagon is 12. Find its area.

- A) $864\sqrt{3}$ B) $144\sqrt{3}$ C) 432 D) $288\sqrt{3}$

24. Approximate to the thousandths, area of a regular pentagon with side length 6.

- A) 123.874 B) 103.229 C) 61.937 D) 3.633

25. Two spheres fit exactly when placed one on top of the other inside a cylinder. Find the ratio of the volume of the cylinder to the sum of the volumes of the spheres.
- A) 3:2 B) 2:3 C) 3: 2π D) 3π : 2

26. Find the total surface area of a cone with diameter 10cm and altitude 12cm.

- A) $75\pi \text{ cm}^2$ B) $90\pi \text{ cm}^2$ C) $230\pi \text{ cm}^2$ D) $85\pi \text{ cm}^2$

27. The volume of sphere is $36\pi \text{ cm}^3$. Find the surface area.

- A) $36\pi \text{ cm}^2$ B) $108\pi \text{ cm}^2$ C) $230\pi \text{ cm}^2$ D) $85\pi \text{ cm}^2$

28. The base of a triangular prism is an equilateral triangle with a perimeter of 24 inches. If the height of the prism is 5 in., find the lateral area.

- A) 120 in^2 B) 60 in^2 C) 40 in^2 D) 360 in^2

29. Which statement is NOT true?

- A) All squares are rhombi. B) All squares are rectangles.
 C) All rhombi are kites. D) All rhombi are parallelogram.

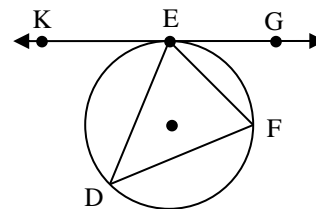
30. A cone and a cylinder have equal radii and heights. What is the ratio of their volume?

- A) 1: 1 B) 1: 3 C) 1: 2 D) Not enough info.

31. The areas of two $30^\circ - 60^\circ - 90^\circ$ triangles are in the ratio of 1:4. If the hypotenuse of the larger triangle is 12, what is the length of the side opposite of the 60° angle in the smaller triangle?

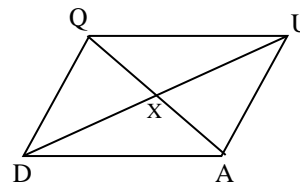
- A) 6 B) 3 C) $3\sqrt{3}$ D) $\frac{3}{2}$

32. In the circle, arc $DF = 120^\circ$ and the $m\angle D = 70^\circ$. Find the $m\angle DEK$.



- A) 50° B) 60° C) 100° D) 35°

33. QUAD is a parallelogram with $QX = DX = 4\sqrt{2}$ and $UA = 8$. Which of the following best describes QUAD? (Figure is not drawn to scale.)



- A) Parallelogram B) Rectangle C) Rhombus D) Square

34. A guy wire attached to the ground at point A is 50 m long and makes an angle of 58° with the ground. Suppose it were fastened at point B, making an angle of 70° with the ground. Which of the following are needed to calculate the new length of the wire?

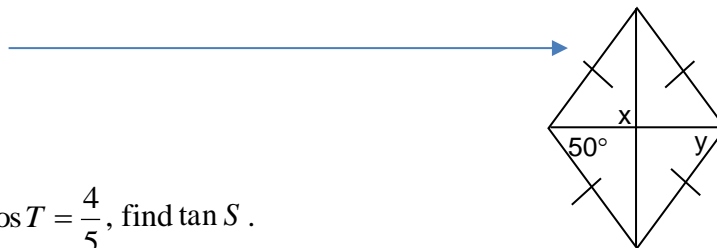
- A) $\sin 58^\circ, \sin 70^\circ$ B) $\cos 58^\circ, \cos 70^\circ$
 C) $\sin 58^\circ, \cos 70^\circ$ D) $\sin 70^\circ, \cos 58^\circ$

35. Sam is flying a kite on a 40-m string. The angle of elevation of the kite measures 35° , and Sam's hand is 1.8 m above the ground. About how high is the kite off the ground? Round to the tenth.

- A) 21.1 m B) 22.9 m C) 23.7 m D) 24.7 m

36. Find the value of x and y.

x = _____ y = _____



37. In $\triangle RST$, $\angle R$ is the right angle. If $\cos T = \frac{4}{5}$, find $\tan S$.

- A) $\frac{5}{4}$ B) $\frac{3}{4}$ C) $\frac{4}{3}$ D) $\frac{4}{5}$

38. A polygon with all sides equal and all angles equal is called

- (A) congruent (B) regular
 (C) hexagon (D) complementary

39. The sum of the exterior angles of a convex hexagon is _____.

40. The sum of the interior angles of a convex octagon is _____.

41. An angle whose vertex is the center of a circle is called a(n) __ angle.

- (A) inscribed (B) circumscribed (C) central (D) adjacent

42. A segment that joins the center with a point on a circle is known as a

- (A) radius (B) diameter (C) secant (D) chord

43. A chord of a circle which passes through the center is a _____

- (A) secant (B) tangent (C) diameter (D) radius

44. An arc of a circle that has a measure of 180 is known as a(n)

- (A) minor arc (B) major arc (C) semi-circle (D) central angle

45. Find the volume of a cylinder with radius 6 and height 8.

- (A) 96π (B) 912.96π (C) 384π (D) 288π

46. Find the volume of a sphere with a radius of 10 cm. Round to the tenth.

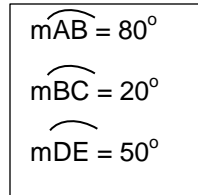
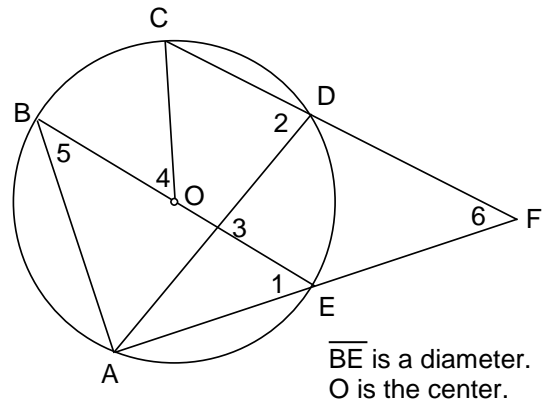
- (A) 4188.8 cm^3 (B) 418.9 cm^3 (C) 1256.6 cm^3 (D) none

47. Find the surface area of a sphere with a diameter of 6 inches.

- (A) 2714.3 in^2 (B) 113.1 in^2 (C) 904.8 in^2 (D) none

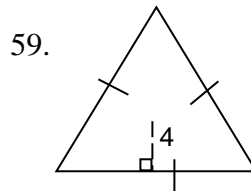
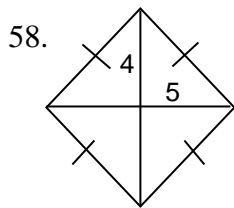
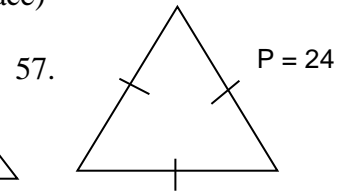
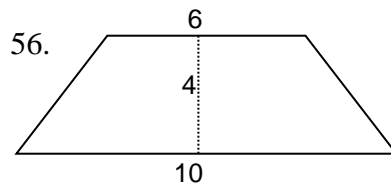
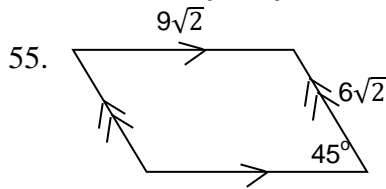
48 – 53: Use the circle to answer the following:

48. $m\angle 1 =$
 (A) 30° (B) 40° (C) 50° (D) 80°
49. $m\angle 2 =$
 (A) 50° (B) 100° (C) 40° (D) 120°
50. $m\angle 3 =$
 (A) 65° (B) 15° (C) 110° (D) 130°
51. $m\angle 4 =$
 (A) 10° (B) 20° (C) 30° (D) 40°
52. $m\angle 5 =$
 (A) 100° (B) 200° (C) 25° (D) 50°
53. $m\angle 6 =$
 (A) 75° (B) 25° (C) 15° (D) 10°



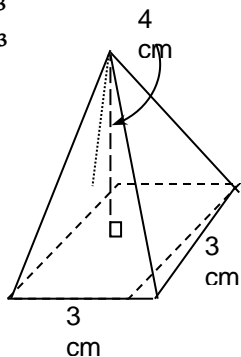
54. Write an equation for a circle with center T(-4, -3) and a diameter of 12 units.

Find the area of the following figures: (exact and thousandths place)

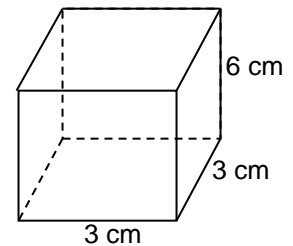


60. A regular hexagon with apothem $8\sqrt{3}$.

61. Find the volume of this pyramid.
 (A) 18 cm^3
 (B) 36 cm^3
 (C) 12 cm^3
 (D) 54 cm^3



62. Find the surface area of this prism
 (A) 72 cm^2
 (B) 81 cm^2
 (C) 90 cm^2
 (D) 54 cm^2



63. Circle **ALL** the proportions which are correct for the following diagram.

(a) $\frac{b}{a} = \frac{d}{c}$

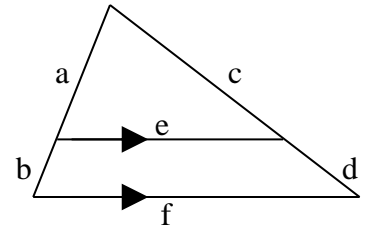
(b) $\frac{a+b}{a} = \frac{c+d}{d}$

(c) $\frac{c}{c+d} = \frac{a}{b+a}$

(d) $\frac{a}{c} = \frac{b}{d}$

(e) $\frac{a}{b} = \frac{e}{f}$

(f) $\frac{c}{c+d} = \frac{e}{f}$



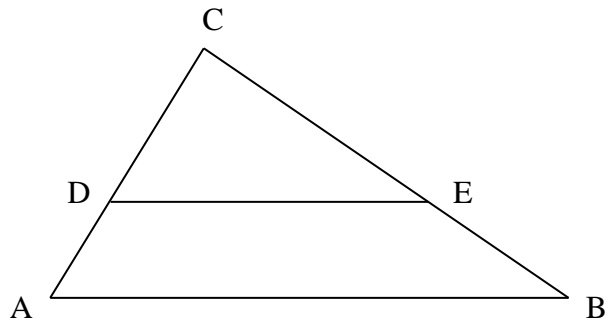
In #64 – 67: $\overline{DE} \parallel \overline{AB}$

64. $AC = 12, CD = 4, BC = 24, CE = _? _.$

65. $AB = 8, EB = 4, CE = 12, DE = _? _.$

66. $AC = 15, AD = 3, BC = 25, BE = _? _.$

67. $AD = 6, CD = 4, CE = 7, BC = _? _.$

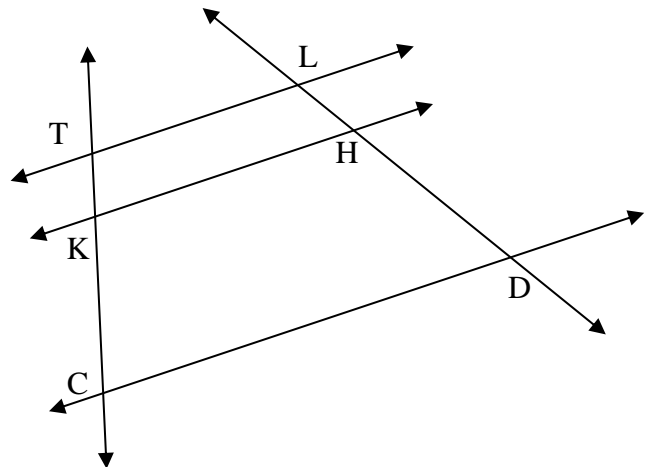


In #68 – 70: $\overline{TL} \parallel \overline{KH} \parallel \overline{CD}$.

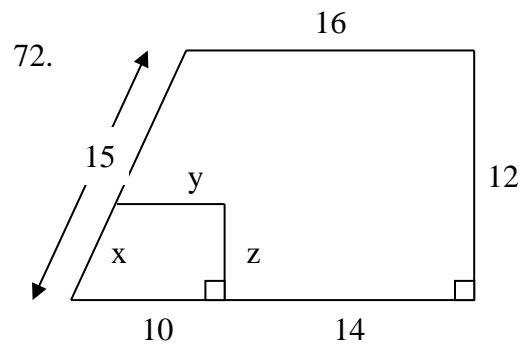
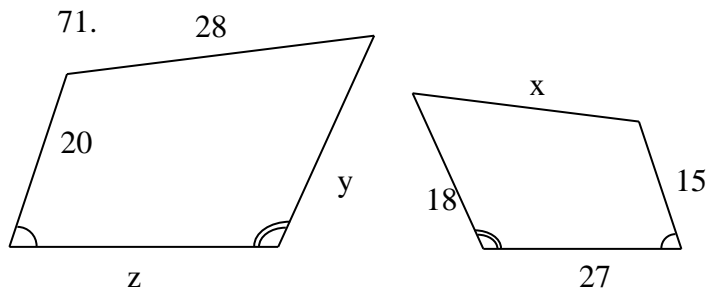
68. $TK = 8, HD = 24, LD = 36, KC = _? _.$

69. $KC = 24, TK = 8, LD = 48, HD = _? _.$

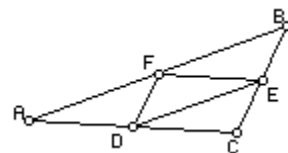
70. $LH = 25, KC = 36, HD = 45, TK = _? _.$



In #71 - 72, the polygons shown are similar. Find the values of x, y and z.



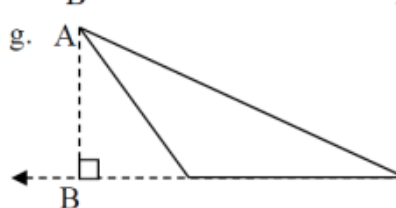
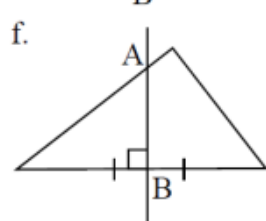
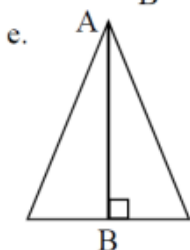
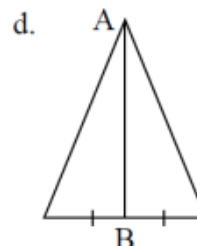
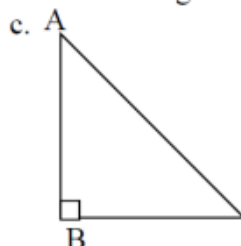
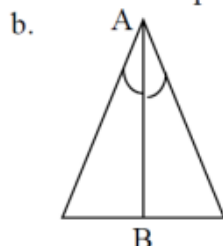
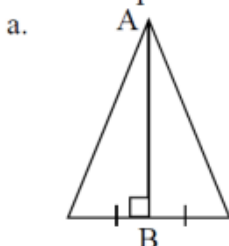
73. Assume that E, F, and D are midpoints of the segment they lie on. Which segments are congruent and which segments are parallel?



74. Using the diagram from 73, find x when $FD = 7x$ and $BC = 56$.

75. What POC goes with each special segment of a triangle and what are the special properties of the special segment of the triangle?
- Perpendicular bisector
 - Angle bisector
 - Median
 - Altitude

76. State the special segment that \overline{AB} represents in each triangle below.



77. True or False. If a statement is true, explain why it is true. If a statement is false, provide a counterexample.
- A median of a scalene triangle goes through a vertex and a midpoint.
 - An angle bisector of a scalene triangle goes through a midpoint.
 - An altitude is always in the interior of the triangle.
 - The altitude of an isosceles triangle drawn from its vertex angle is also an angle bisector.
 - An altitude of a scalene triangle goes through a midpoint.
 - The three medians of any triangle are concurrent.

78. In $\triangle PQR$, $m\angle P < m\angle Q$, $QR = 3x - 7$, and $PR = 2x + 5$. Write an inequality and solve it to give the restrictions on x .

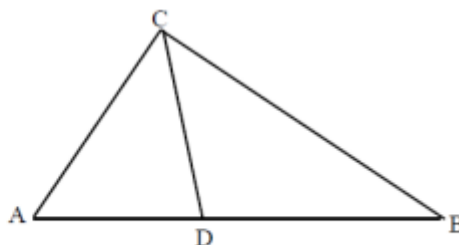
79. Given: \overline{CD} is a median.

$$AC = 4x - 1$$

$$BC = 20$$

$$AD = 2x^2 - 12$$

$$DB = x^2 - x$$



- Find: AC , AD , and DB .
- List the angles of $\triangle ABC$ in order from least to greatest.