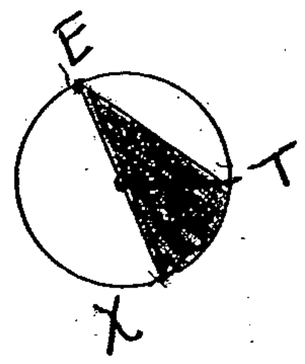
Key

Geometry Spring Final Review Questions / 09

a 1. Given a sphere inscribed in a cube, find the ratio of the sphere's volume to that of a second sphere circumscribed about the same cube.

a. $1 : 2\sqrt{2}$ b. $2: 3\sqrt{2}$ c. $1: 2$

b 2. Find the area of the shaded region if $m < TEX = 30°$ and diameter $\overline{EX} = 12$.



a. $18\sqrt{3} + 3\pi$ b. $9\sqrt{3} + 6\pi$

c. $\frac{9\sqrt{3}}{2} + 6\pi$ d. none of the above

3. A plastic bowl is in the shape of a cylinder with a hemisphere cut out inside. The height of the bowl is 8 cm, the diameter of the cylinder is 14 cm, and the diameter of the sphere is 12 cm. Find the volume of the plastic used to make the bowl. (diagram below)

$248\pi\ cm^3$

4. A sector of a circle has an arc length of 2.4 feet and an area of 14.3 ft^2. How many degrees are in the central angle ?

11.539°

5. A belt is stretched over two pulleys whose radii are 10 cm. and 50 cm. The distance between the centers of the two pulleys is 80 cm. Find the length of the entire belt. The two common external tangents are congruent.

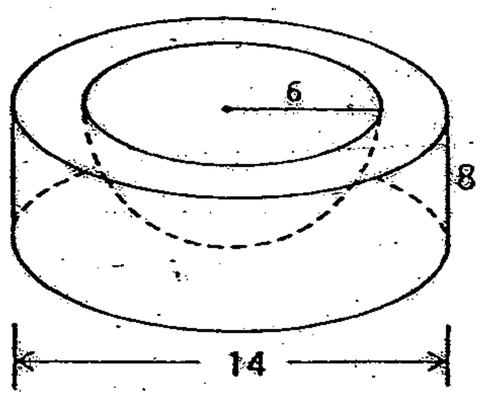
$\frac{220\pi}{3} + 80\sqrt{3}$

6. An ice-cube manufacturer makes ice cubes with holes in them. Each cube is 4 cm. on a side and the hole is 2 cm. in diameter. Find the surface area of a single cube.

$96 + 16\pi$

7. Find the area of a regular dodecagon inscribed in a circle with radius 1. 3

3.



8. A regular hexagonal pyramid with base edge 6 and height 8 is inscribed in a cone. Find the lateral area of the cone and the pyramid.

$LA_{cone} = 60\pi$ $LA_{pyramid} = 18\sqrt{91}$

9. ABCD is a square. M is the point one-third of the way from B to C. N is the point one-half of the way from D to C. Find the measure of θ. (diagram below)

45°

10. Point $(6, 7)$ lies on the circle $(x+2)^2 + (y-1)^2 = 100$. Find the equation of the line that is tangent to the circle at the point $(6, 7)$.

$y - 7 = -4/3(x - 6)$

11. Write a coordinate proof to prove that the diagonals of a rectangle are congruent. Include a diagram.

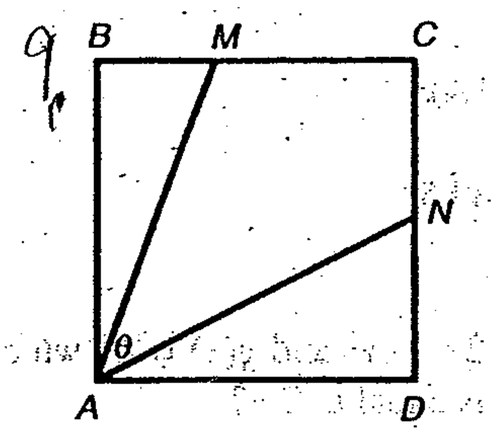
12. ⊙ O with tangents $\overline{AB}$ and $\overline{FE}$. m BG = 80°, m GF = 90°, and m < GJF = 65°. Find m < A and m < CFE. (diagram below)

$m\angle A = 10^\circ$

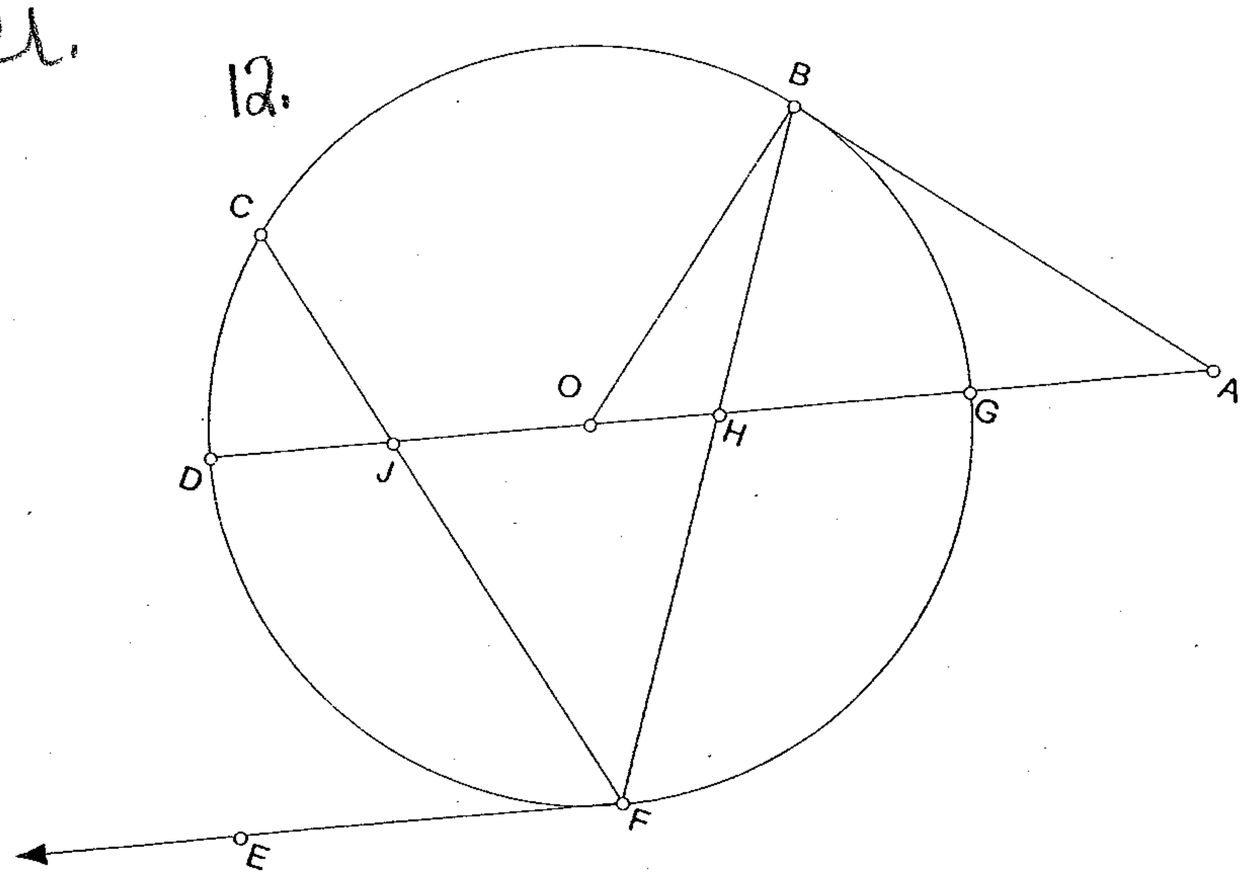
$m\angle CFE = 65^\circ$

14. A 6 m. ladder reaches higher up a wall when placed at an angle of elevation of 70° than when placed at an angle of elevation of 50°. How much higher ?

1.042 m higher.

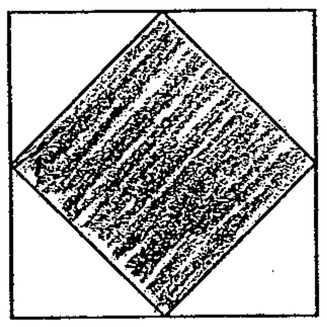


12.

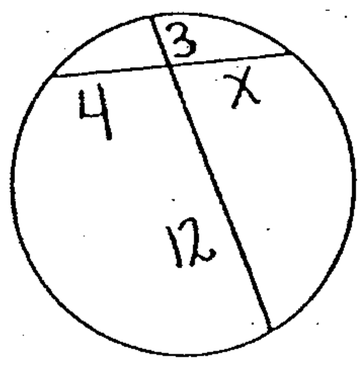


16. In this window pane, the vertices of the shaded square are the midpoints of the sides of the large square. Show how the area of he larger square is related to the area of the shaded square.

2:1

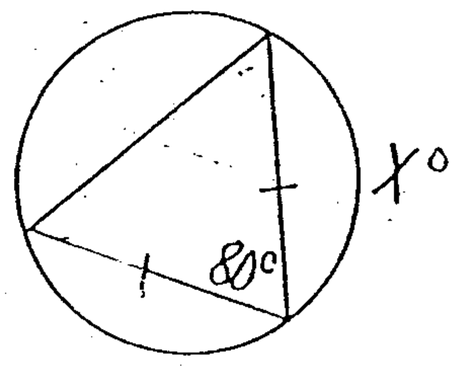


17. Find x. a)



X=9

b)



X=100°

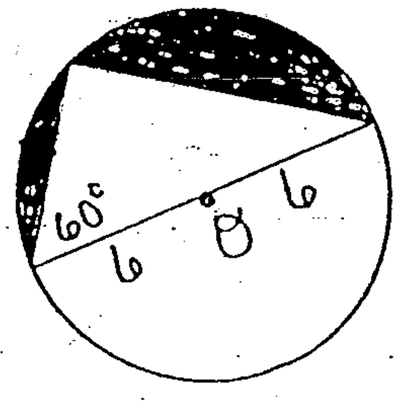
18. The volume of a sphere is $36\pi\ m^3$. Find its area.

$36\pi\ m^2$

19. An equilateral triangle with sides of length 10 is inscribed in a circle. Find the area of the circle.

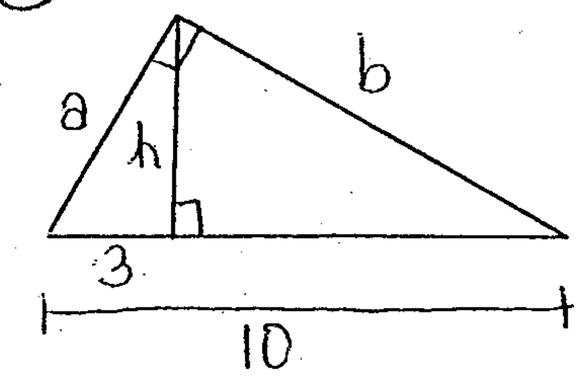
$A = \left(\frac{10\sqrt{3}}{3}\right)^2\pi = \frac{100\pi}{3}$

20. Find the area of the shaded region. Point O marks the center of the circle.



$18\pi - 18\sqrt{3}$

21. Find the values of h, a, and b



$h=\sqrt{21}$

$a=\sqrt{30}$

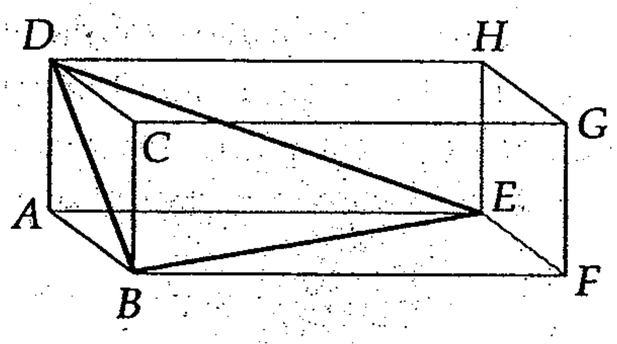
$b=\sqrt{70}$

22. What is the length of the longest diagonal that can fit in a cube that has a volume of 27 ?

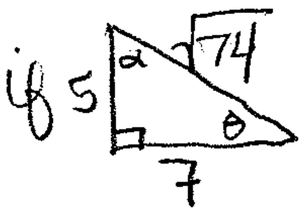
$3\sqrt{3}$

23. In the rectangular solid show, if AB = 4, BC = 3, and BF = 12, what is the perimeter of triangle EDB ?

a. 27.33 b. 28.40 c. 29.20 d. 29.50 e. 30.02



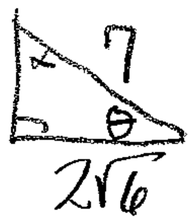
24. If two sides of a right triangle are 5 and 7, find all possibilities for the set of three angles.
Note that the longer given side may be either a leg or a hypotenuse.



$\tan\theta = \frac{5}{7}$ $\tan\alpha = \frac{7}{5}$

$\theta \approx 35.538°$ $\alpha = 54.462°$

OR



$\tan\theta = \frac{5}{2\sqrt{6}}$

$\theta \approx 45.584°$

$\tan\alpha = \frac{2\sqrt{6}}{5}$

$\alpha \approx 44.415°$

Suggested review problems in your book

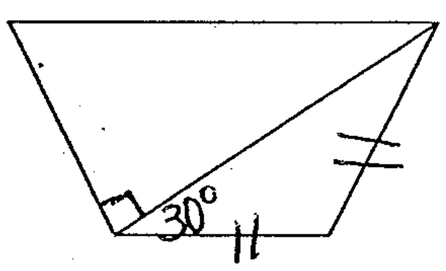
Page 434; 8

Page 598; 5, 7, 8, 11, 13, 16, 19, 20, 23, 25, 26, 28, 29, 30, 32, 33, 35, 38

Page 706; 1, 2, 3, 4, 5, 6, 9, 11, 12, 14, 15, 18, 19, 20, 21, 22, 23, 24, 25, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 39, 45,

Redo all of your old tests and check your answers

25. Find the area of the isosceles trapezoid if the longer base is 12.



$A = 27\sqrt{3}$

26. Which of the following statement(s) is(are) false **and why**?

a) $a^2 - x^2 = b^2 - y^2$

b) $a \cdot b = c \cdot h$

c) $x \cdot y = h^2$

d) $\frac{y}{x} = \frac{b}{c}$

e) $\frac{c}{a} = \frac{a}{x}$