

Name: Key

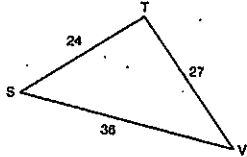
Period:

Score: _____ / 10

SEMESTER 2 FINAL REVIEW PACKET

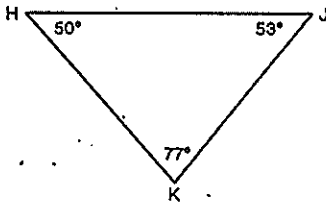
You will complete the following problems. We will have time to work on this in class, and you will continue working on it at home. Answers (not solutions) are posted on the classroom website – CHECK THEM! This packet is worth 10 points! **It is due on the day of your final exam** (June 6 for periods 1 and 2...June 7 for period 3...June 8 for periods 5 and 6)

1. Write the angles in order from smallest to largest.



$\angle V, \angle S, \angle T$

2. Write the sides in order from shortest to longest.



$\overline{JK}, \overline{HK}, \overline{HJ}$

3. Tell whether a triangle can have sides with the given lengths. Explain.

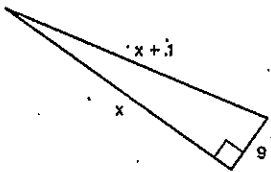
a. 3, 5, 8

b. 11, 15, 21

No, $5+3$ is not greater than 8

yes, $11+15 > 21$
(sum of 2 shorter sides is greater than largest side)

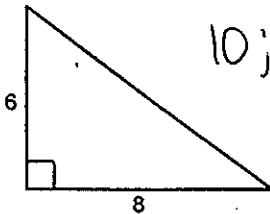
4. Find the value of x. Give exact answer(s) only.



$x = 40$

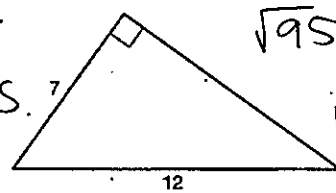
5. Find the missing side length. Tell whether the side lengths form a Pythagorean Triple. Explain.

a.



10; yes because all side lengths are integer values

b.



$\sqrt{195}$; No, $\sqrt{195}$ is not an integer

6. Tell whether the measures can be side lengths of a triangle. If so, classify the triangle as acute, right, or obtuse.

a. 4, 7, 9

b. 8, 8, 11

c. 5, 14, 20

yes Δ

yes Δ

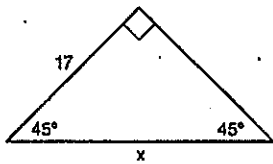
NO Δ

obtuse Δ

acute Δ

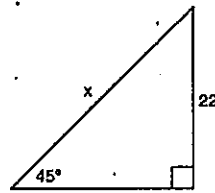
7. Find the value of x. Give exact answer(s) only.

a.



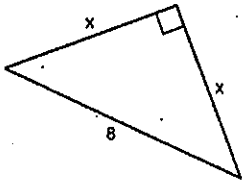
$$x = 17\sqrt{2}$$

b.



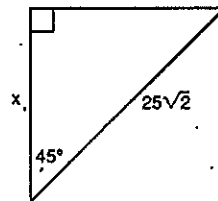
$$x = 22\sqrt{2}$$

c.



$$x = 4\sqrt{2}$$

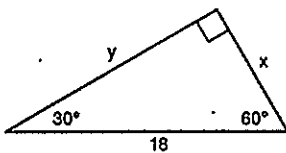
d.



$$x = 25$$

8. Find the values of x and y. Give exact answers only.

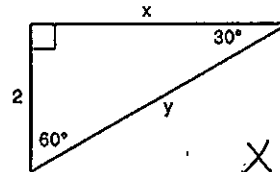
a.



$$x = 9$$

$$y = 9\sqrt{3}$$

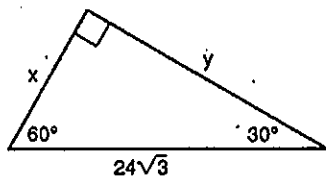
b.



$$x = 2\sqrt{3}$$

$$y = 4$$

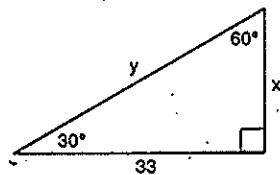
c.



$$x = 12\sqrt{3}$$

$$y = 36$$

d.

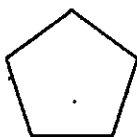


$$x = 11\sqrt{3}$$

$$y = 22\sqrt{3}$$

9. Tell whether each figure is a polygon. If it is a polygon, name it by the number of sides.

a.



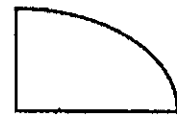
yes, polygon;
pentagon

b.



yes, polygon;
heptagon

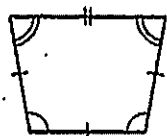
c.



Not a polygon

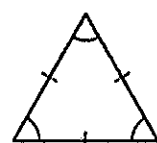
10. Tell whether each polygon is regular or irregular. Then tell whether it is concave or convex.

a.



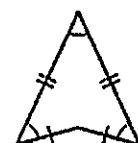
irregular
convex

b.



regular
convex

c.



irregular
concave

11. Find the sum of the interior angle measures of each convex polygon.

a. Pentagon

b. octagon

c. nonagon

$$540^\circ$$

$$1080^\circ$$

$$1260^\circ$$

12. Find the measure of each interior angle of each regular polygon. Round to two decimal places, if necessary.

a. Pentagon

b. heptagon

c. 15-gon

$$108^\circ$$

$$\approx 128.57^\circ$$

$$156^\circ$$

13. Find the measure of each exterior angle of each regular polygon.

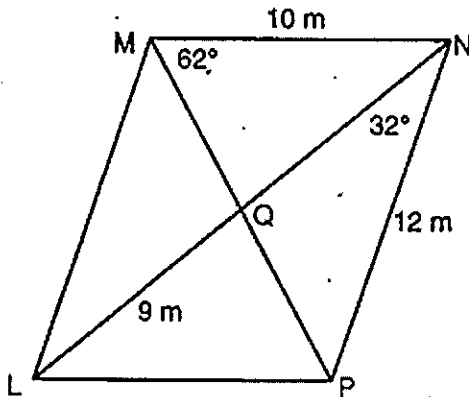
a. Quadrilateral

b. octagon

$$90^\circ$$

$$45^\circ$$

14. Use the diagram to find the following in parallelogram LMNP.



a. $ML = \underline{12 \text{ m}}$

b. $LP = \underline{10 \text{ m}}$

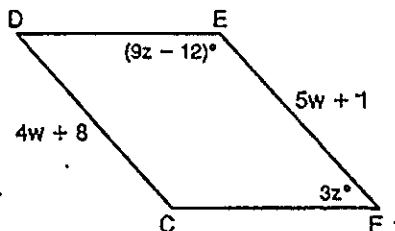
c. $LN = \underline{18 \text{ m}}$

d. $QN = \underline{9 \text{ m}}$

e. $m\angle LPM = \underline{62^\circ}$

f. $m\angle MLN = \underline{32^\circ}$

15. CDEF is a parallelogram. Find each measure.



a. $CD = \underline{36}$

b. $EF = \underline{36}$


c. $m\angle F = \underline{48^\circ}$


d. $m\angle E = \underline{132^\circ}$

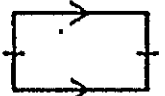
16. The coordinates of three vertices of a parallelogram KLMN are as follows: K(-4, 7), L(3, 6), M(5, 3). Find the coordinates of vertex N.


$(-2, 4)$

17. Determine whether each quadrilateral must be a parallelogram. Justify your answer.

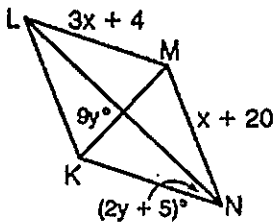
a.  yes!
if one pair of sides is \parallel AND \cong \rightarrow \parallel -gram

b.  yes!
if diags bisect each other \rightarrow \parallel -gram

c.  NO (might be a trapezoid)

d.  yes!
if opp. \angle s \cong \rightarrow \parallel -gram

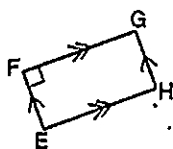
18. KLMN is a rhombus. Find each measure.

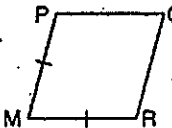


a. $KL = \underline{28}$

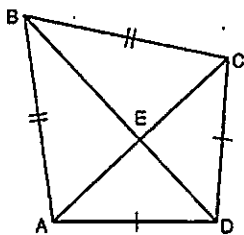
b. $m\angle MNK = \underline{50^\circ}$

19. Determine whether the conclusion is valid. If not, tell what additional information is needed to make it valid.

a. $EFGH$ is a rectangle. yes valid!
 \parallel -gram w/ one right angle

b. $MPQR$ is a rhombus. NOT valid!
 we need to know all sides are \cong , not just 2

20. In kite ABCD, $m\angle BCD = 98^\circ$ and $m\angle ADE = 47^\circ$. Find each measure.

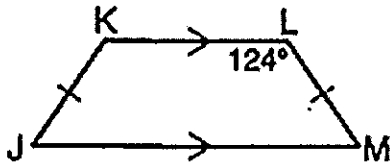


a. $m\angle DAE = \underline{43^\circ}$

b. $m\angle BCE = \underline{55^\circ}$

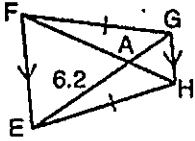
c. $m\angle ABC = \underline{70^\circ}$

21. Find $m\angle J$ in trapezoid JKLM.



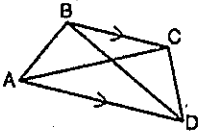
56°

22. In trapezoid EFGH, FH = 9. Find AG.



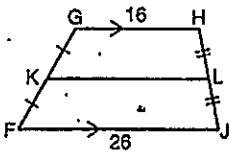
$$AG = 2.8$$

23. In the diagram, $AC = 2z + 9$ and $BD = 4z - 3$. Find the value of z that makes the trapezoid isosceles.



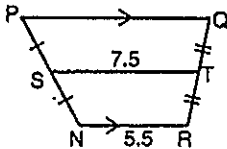
$$z = 6$$

24. Find KL.



$$KL = 21$$

25. Find PQ.



$$PQ = 9.5$$

26. Solve each proportion.

a. $\frac{24}{42} = \frac{y}{7}$

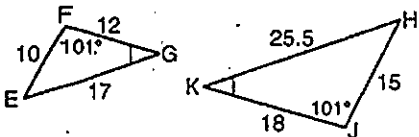
$$y = 4$$

b. $\frac{2a}{3} = \frac{8}{3a}$

$$a = \pm 2$$

27. Determine whether the polygons are similar. If so, write the similarity ratio and a similarity statement.

$\triangle EFG$ and $\triangle HJK$



Yes ~

$$\triangle EFG \sim \triangle HJK \quad \left\{ \begin{array}{l} \triangle HJK \sim \triangle EFG \\ \text{ratio} = \frac{3}{2} \\ \text{ratio} = \frac{2}{3} \end{array} \right.$$

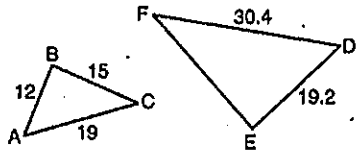
28. A rectangle is 3.2 cm wide and 8 cm long. A similar rectangle is 5 cm long. What is the width of the second rectangle?

$$2 \text{ cm}$$

29. Rectangle CDEF \sim rectangle GHJK, and the similarity ratio of CDEF to GHJK is $\frac{1}{16}$. If DE = 20, what is ~~HJ~~ HJ?

$$\frac{HJ}{20} = \frac{1}{16} \implies HJ = 320$$

30. $\triangle ABC \sim \triangle DEF$. What is EF?

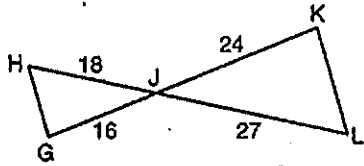


$$EF = 24$$

31. $\triangle MNP \sim \triangle QRS$ and the ratio of $\triangle MNP$ to $\triangle QRS$ is 5:2. If $MN = 42$ meters, what is QR?

$$QR = 16.8$$

32. Explain how you know the triangles are similar, and write a similarity statement.

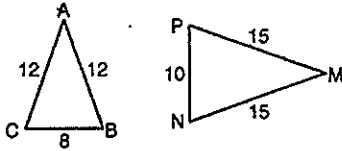


$\triangle HJG \sim \triangle LJK$ by SAS \sim

$\angle HJG \cong \angle LJK$ by vertical \angle s \cong

$$\frac{HJ}{JL} = \frac{2}{3}; \frac{JG}{JK} = \frac{2}{3}; \frac{HJ}{JL} = \frac{JG}{JK} \text{ by trans.}$$

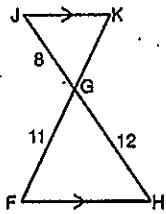
33. Verify that $\triangle ABC \sim \triangle MNP$.



$$\frac{AC}{PM} = \frac{AB}{MN} = \frac{BC}{PN} = \frac{4}{5}$$

SO \triangle s are \sim by SSS \sim

34. Explain why the triangles are similar. Then find GK.

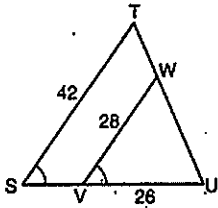


\triangle s \sim by AA \sim

$\angle K \cong \angle F$
 $\angle J \cong \angle H$ } by $\parallel \rightarrow$ alt. int. \angle s \cong

$$GK = 7\frac{1}{3}$$

35. Explain why the triangles are similar. Then find US.

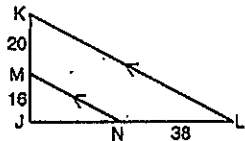


\triangle s \sim by AA \sim

$\angle U \cong \angle U$ by reflex. prop. \cong
 $\angle S \cong \angle W$ was given

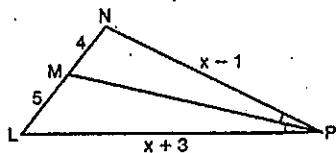
$$US = 39$$

36. Find JN.



$$JN = 30.4$$

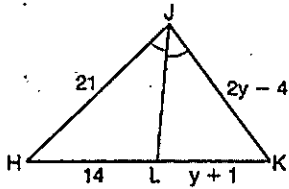
37. Find NP and LP.



$$NP = 16$$

$$LP = 20$$

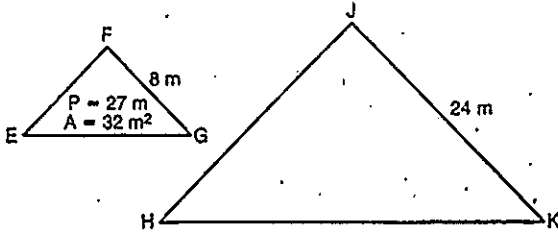
38. Find JK and LK.



$$LK = 12$$

$$JK = 18$$

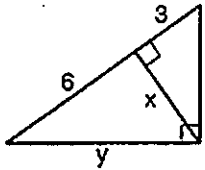
39. $\triangle EFG \sim \triangle HJK$. Find the perimeter and area of $\triangle HJK$.



$$\text{perimeter} = 81 \text{ m}$$

$$\text{area} = 288 \text{ m}^2$$

40. Find the values of x, y, and z.

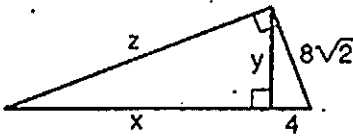


$$x = 3\sqrt{2}$$

$$y = 3\sqrt{6}$$

$$z = 3\sqrt{3}$$

41. Find the values of x, y, and z.

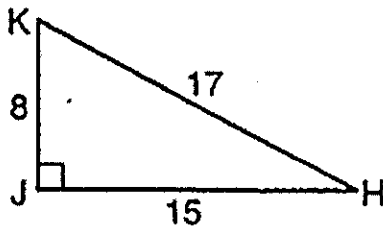


$$x = 28$$

$$y = 4\sqrt{7}$$

$$z = 8\sqrt{14}$$

42. Write each trigonometric ratio as a fraction and as a decimal rounded to two decimal places.



a. $\sin K = \frac{15}{17} \approx 0.88$

b. $\cos H = \frac{15}{17} \approx 0.88$

c. $\cos K = \frac{8}{17} \approx 0.47$

d. $\tan H = \frac{8}{15} \approx 0.53$

43. Use special right triangles to write each trigonometric ratio in its exact value.

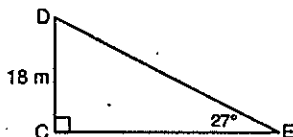
a. $\cos 45^\circ = \frac{\sqrt{2}}{2}$

c. $\sin 60^\circ = \frac{\sqrt{3}}{2}$

b. $\tan 45^\circ = 1$

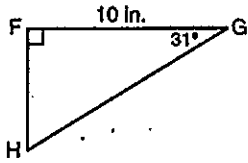
d. $\tan 30^\circ = \frac{\sqrt{3}}{3}$

44. Find DE.



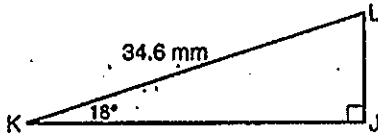
$$DE \approx 39.65 \text{ m}$$

45. Find FH.



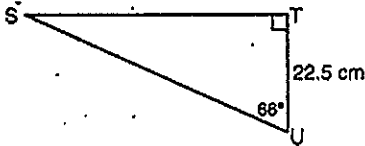
$FH \approx 6.01 \text{ in}$

46. Find JK.



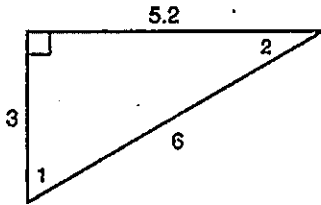
$JK \approx 32.91 \text{ mm}$

47. Find US.



$US \approx 55.32 \text{ cm}$

48. If $\cos A = \frac{13}{15}$, $\angle A$ is referring to which angle: $\angle 1$ or $\angle 2$?

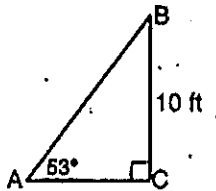


$\angle 2$

49. In the diagram from #48, if $\tan A = \frac{15}{26}$, $\angle A$ is referring to which angle: $\angle 1$ or $\angle 2$?

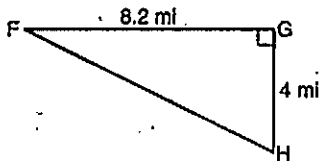
$\angle 2$

50. Solve the triangle.



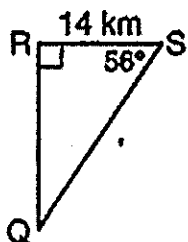
$m\angle B = 37^\circ$; $AC \approx 7.54$; $AB \approx 12.52$

51. Solve the triangle.



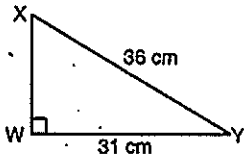
$FH \approx 9.12$; $m\angle F \approx 26^\circ$; $m\angle H \approx 64^\circ$

52. Solve the triangle.



$m\angle Q = 34^\circ$; $RQ \approx 20.78 \text{ km}$; $SQ \approx 25.04 \text{ km}$

53. Solve the triangle.



$$XW \approx 18.30 \text{ cm}$$

$$m\angle X \approx 59.44$$

$$m\angle Y \approx 30.56$$

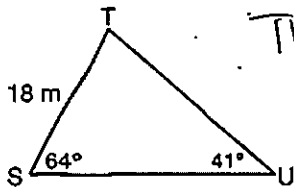
54. When the angle of elevation to the sun is 52° , a tree casts a shadow that is 9 meters long. What is the height of the tree? Round to the nearest tenth of a meter.

$$\approx 11.5 \text{ m}$$

55. A person snorkeling sees a turtle on the ocean floor at an angle of depression of 38° . She is 14 feet above the ocean floor. How far is she from the turtle? Round to the nearest foot.

$$\approx 23 \text{ ft}$$

56. Solve the triangle.

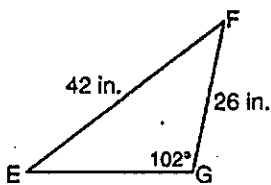


$$TU \approx 24.7$$

$$SU \approx 26.54$$

$$m\angle T = 75^\circ$$

57. Solve the triangle.

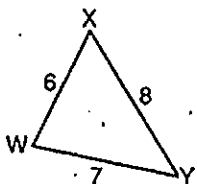


$$m\angle E \approx 37.3^\circ$$

$$EF \approx 28.00$$

$$m\angle F \approx 40.7^\circ$$

58. Solve the triangle.

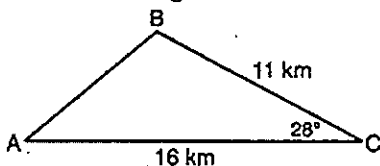


$$m\angle X \approx 57.9^\circ$$

$$m\angle W \approx 75.5^\circ$$

$$m\angle Y \approx 46.6^\circ$$

59. Solve the triangle.

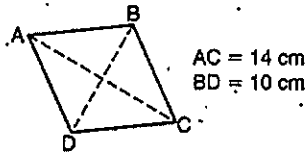


$$AB \approx 8.14$$

$$m\angle A \approx 39.4^\circ$$

$$m\angle B \approx 112.6^\circ$$

60. Find the area of the rhombus.



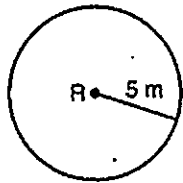
$$A = 70 \text{ cm}^2$$

61. Find the length of the second diagonal of the kite if the area is 414 ft^2 .



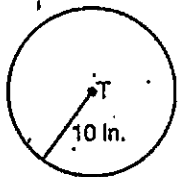
$$d_2 = 36 \text{ ft}$$

62. Find the area of the circle. Give exact answer.



$$25\pi \text{ m}^2$$

63. Find the circumference of the circle. Give exact answer.



$$20\pi \text{ in}$$

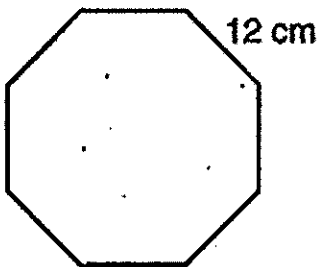
64. Find the circumference of the circle whose area is $49\pi \text{ in}^2$.

$$14\pi \text{ in}$$

65. Find the radius of the circle whose circumference is $18\pi \text{ cm}$.

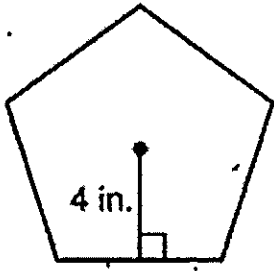
$$9 \text{ cm}$$

66. Find the area of the regular polygon.



$$A \approx 695.29 \text{ cm}^2$$

67. Find the area of the regular polygon.

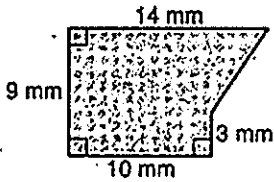


$$A \approx 58.12 \text{ in}^2$$

68. Find the area of the regular hexagon with an apothem of 3m.

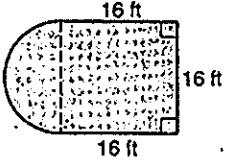
$$A \approx 31.18 \text{ m}^2$$

69. Find the shaded area. Round to two decimal places, if necessary.



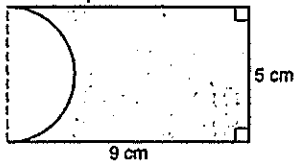
$$102 \text{ mm}^2$$

70. Find the shaded area. Round to two decimal places, if necessary.



$$A \approx 356.53 \text{ ft}^2$$

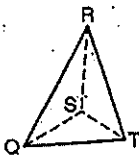
71. Find the shaded area. Round to two decimal places, if necessary.



$$\approx 35.18 \text{ cm}^2$$

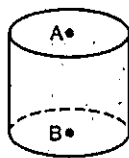
72. Classify the figure given.

a.



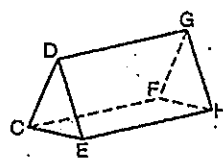
triangular pyramid

b.



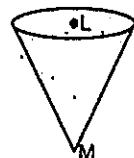
cylinder

c.



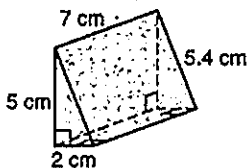
triangular prism

d.



cone

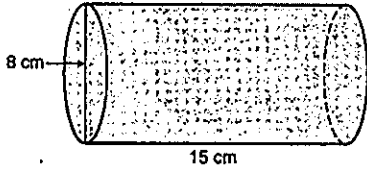
73. Find the lateral area and the surface area of the prism.



$$LA = 86.8 \text{ cm}^2$$

$$SA = 96.8 \text{ cm}^2$$

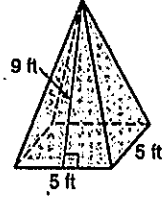
74. Find the lateral area and the surface area of the cylinder. Give exact answers.



$$LA = 120\pi \text{ cm}^2$$

$$SA = 152\pi \text{ cm}^2$$

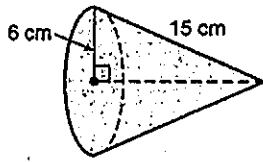
75. Find the lateral area and the surface area of the pyramid. Round to the nearest tenth, if necessary.



$$LA = 90 \text{ ft}^2$$

$$SA = 115 \text{ ft}^2$$

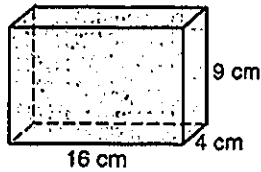
76. Find the lateral area and the surface area of the right cone. Give exact answers.



$$LA = 90\pi \text{ cm}^2$$

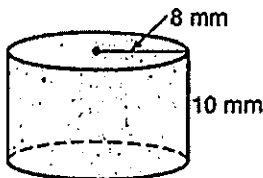
$$SA = 126\pi \text{ cm}^2$$

77. Find the volume of the prism.



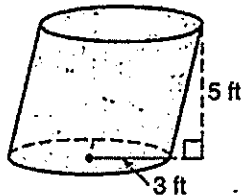
$$V = 576 \text{ cm}^3$$

78. Find the volume of the cylinder. Give exact answer.



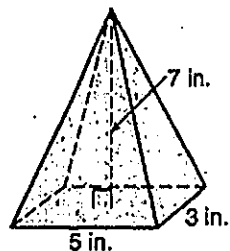
$$V = 640\pi \text{ mm}^3$$

79. Find the volume of the cylinder. Give exact answer.



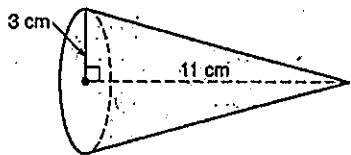
$$V = 45\pi \text{ ft}^3$$

80. Find the volume of the pyramid. Round to the nearest tenth, if necessary.



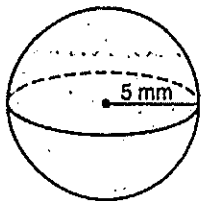
$$V = 35 \text{ in}^3$$

81. Find the volume of the cone. Give exact answer.



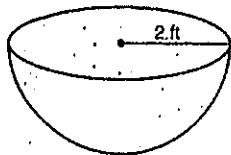
$$V = 33\pi \text{ cm}^3$$

82. Find the volume of the sphere. Give exact answer.



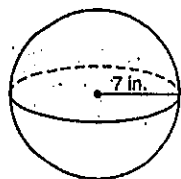
$$V = \frac{500\pi}{3} \text{ mm}^3$$

83. Find the volume of the hemisphere. Give exact answer.



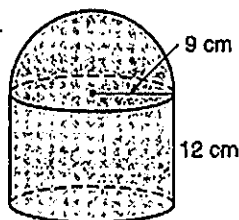
$$V = \frac{16\pi}{3} \text{ ft}^3$$

84. Find the surface area of the sphere. Give exact answer.



$$SA = 196\pi \text{ in}^2$$

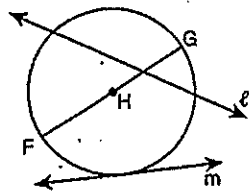
85. Find the surface area AND volume of the composite figure (hemisphere on top of a cylinder). Round answer to the nearest tenth, if necessary.



$$SA \approx 1441.98 \text{ cm}^2$$

$$V \approx 4580.44 \text{ cm}^3$$

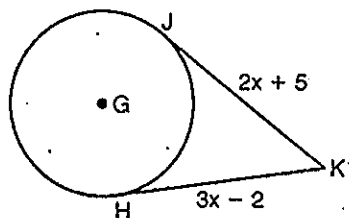
86. Give a name to each line or segment that intersects the circle.



l : secant
 m : tangent

\overline{FG} : diameter (also a chord)
 \overline{HG} : radius

87. Find JK.

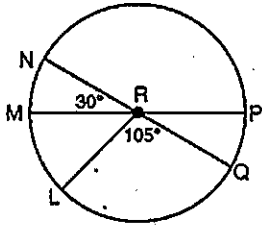


$$JK = 19$$

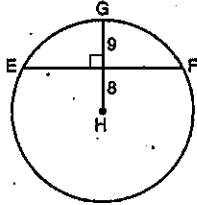
88. Use the figure to find the following...

a. $m\widehat{LMN} = \underline{75^\circ}$

b. $m\widehat{LNP} = \underline{225^\circ}$

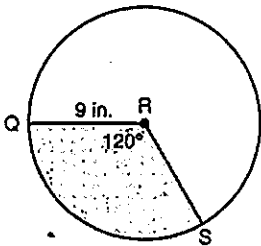


89. Find EF.



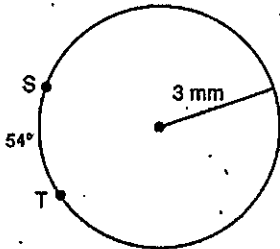
$EF = 30$

90. Find the area of the shaded sector. Give exact answer.



$27\pi \text{ in}^2$

91. Find the length of \widehat{ST} .

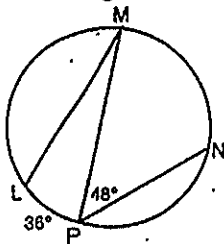


$\frac{9\pi}{10} \text{ mm} \approx 2.83 \text{ mm}$

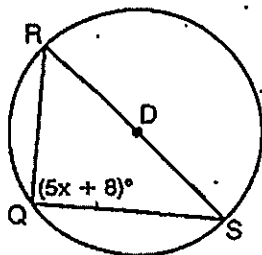
92. Use the diagram to find the following...

a. $m\angle LMP = \underline{18^\circ}$

b. $m\widehat{MN} = \underline{96^\circ}$

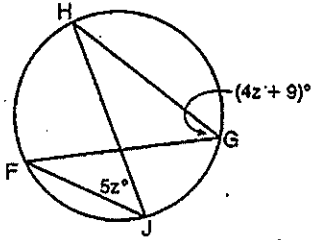


93. Find the value of x.



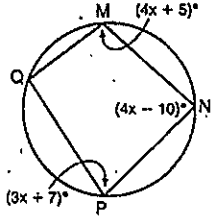
$x = 16.4$

94. Find $m\angle FJH$.



45°

95. Find the measures of each angle in the inscribed quadrilateral.



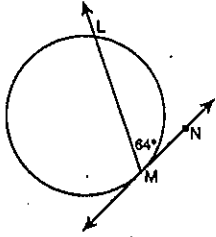
$m\angle M = 101^\circ$

$m\angle N = 86^\circ$

$m\angle P = 79^\circ$

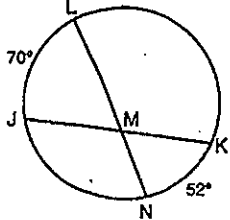
$m\angle Q = 94^\circ$

96. Find $m\widehat{LM}$.



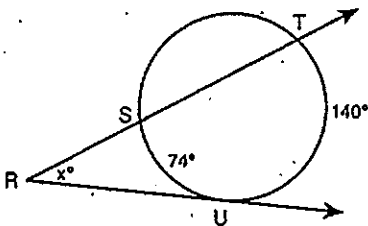
128°

97. Find $m\angle JML$.



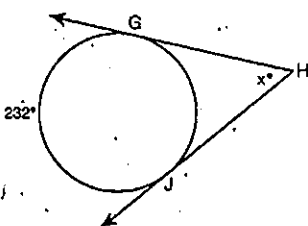
61°

98. Find the value of x.



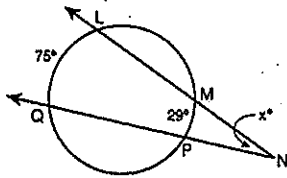
33

99. Find the value of x.



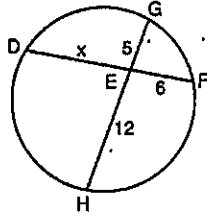
52

100. Find the value of x .



$$23$$

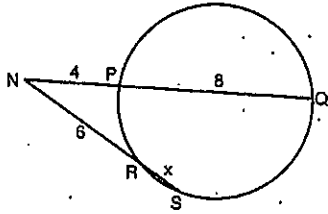
101. Find the value of x . Then find the length of each chord.



$$x = 10$$

$$DF = 16, GH = 17$$

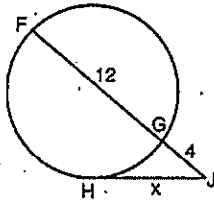
102. Find the value of x . Then find the length of each secant segment.



$$x = 2$$

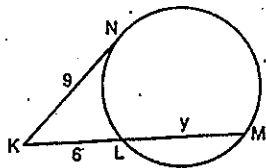
$$NQ = 12, NS = 8$$

103. Find the value of x .



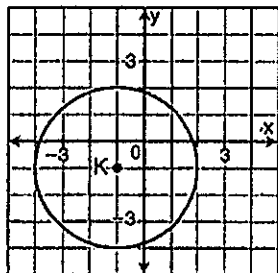
$$x = 8$$

104. Find the value of y .



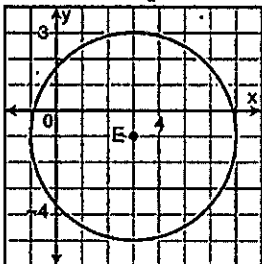
$$y = 7.5$$

105. Write the equation of the circle.



$$(x+1)^2 + (y+1)^2 = 9$$

106. Write the equation of the circle.



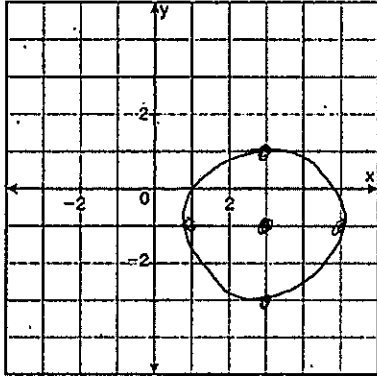
$$(x-3)^2 + (y+1)^2 = 16$$

107. Find the equation of the circle that passes through (3, 6) and has center B(-2, 6)

$$(x+2)^2 + (y-6)^2 = 25$$

108. Graph the equation:

$$(x-3)^2 + (y+1)^2 = 4$$



109. Graph the equation:

$$(x+1)^2 + (y+3)^2 = 16$$

