Unit 7 - Similarity

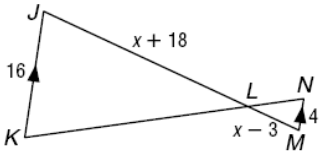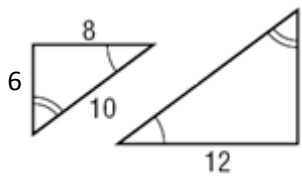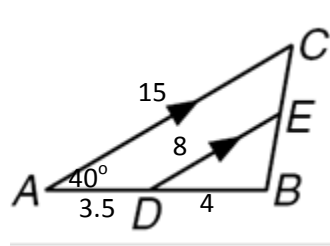|	
1. The ratio of the measures of the angles of a triangle is 4:5:6. What is the smallest angle's measure?	2. The perimeter of a rectangle is 156 cm. The ratio of the length to the width is 9:4. Find the width of the rectangle.
3. Consider the figure at the right. a. Are these two triangles similar? If so justify your answer (SSS~, SAS~, AA~) b. Find x. 24 / 18 / x / 15	4. Consider the figure at the right. a. Are these two triangles similar? If so justify your answer (SSS~, SAS~, AA~) b. Find x and y. y / 8 / 27° / 6 / 63° / 4 / x
5. In $\triangle DEF$, G is the midpoint of DF and H is the midpoint of EF. Suppose $ED = 26$. Draw a figure and find the length of GH.	6. A car is 7.5 feet long and 4.2 feet wide. A scale model is built with a width of 3 inches. How long is the scale model? Round to the nearest tenth.
7. Solve for x. A / $x+1$ / 15 B / C / 12 / E / $x+5$ / D	8. Solve for x. M / 10 / N / 8 / L / P / $x+2$ / S / T / $x-1$
9. If $BD = 15$, $AD = 10$, and $CE = 8$, find EB. C / E / A / D / B	10. Find x if $\triangle JKL \sim \triangle MN1$ J / $x+18$ / 16 / K / L / N / $x-3$ / M / 4

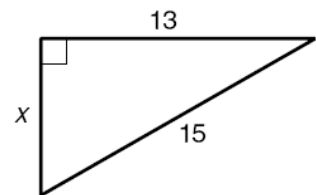|	
11. Find the perimeter of the larger triangle. 8 6 10 12	12. Prove that ΔDBE~ΔABC if $\angle EDB = 7x - 9$. C 15 E 8 A 40° 3.5 D 4 B
13. Find the values of *x*, *y*, and *z*. Round your answers to <u>2 decimal places.</u> 11 y 25 x z	14. Find the values of *x*, *y*, and *z*. Round your answers to <u>2 decimal places.</u> 14 P 2 M x y L z N
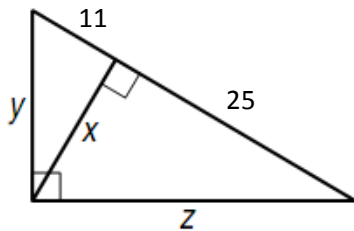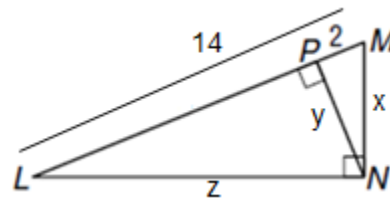
Unit 8 - Trigonometry
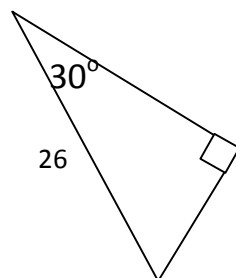
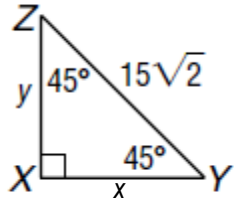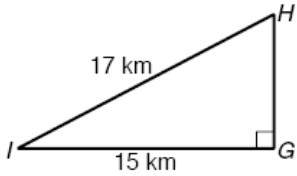|	
15. Find the missing side of the triangle. Round your answer to the nearest hundredth. x 32 12	16. Find the value of *x* to <u>2 decimal places.</u> 13 x 15
17. Find the exact values of the missing side lengths. 30° 26	18. Find the length of *GH* to <u>2 decimal places.</u> 10 in. F 31° G H
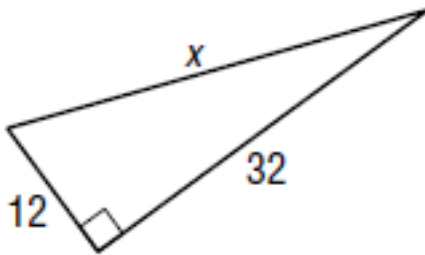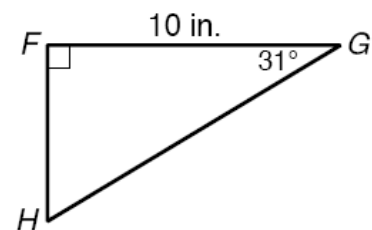
| 19. Find the missing sides of the triangle.	20. Do 90, 106, 56 form a Pythagorean triple? Why or why not?
(triangle with Z at top, X bottom-left with right angle, Y bottom-right; side ZY = $15\sqrt{2}$, angle at Z = 45°, angle at Y = 45°, side y along XZ, side x along XY)	

21. Find the measure of angle *I* to <u>2 decimal places.</u>	22. Calculate the perimeter of a square if the diagonal is 20 inches. Round your answer to the nearest tenth.
(triangle with H at top right, I at bottom left, G at bottom right with right angle; IH = 17 km, IG = 15 km)	

23. For each triangle below, determine whether the 3 parts of the triangle labeled are related by sine, cosine, or tangent.

a.

$b°$

e d

b.

$h°$ g

q

c.

$a°$

y m

d.

w

$n°$

z
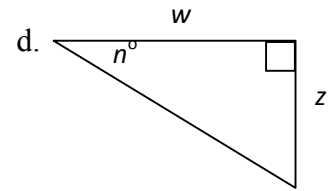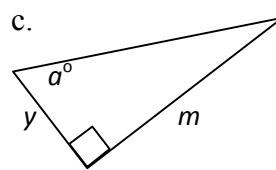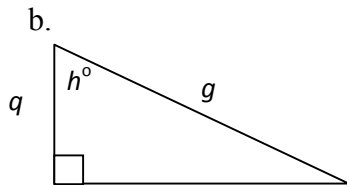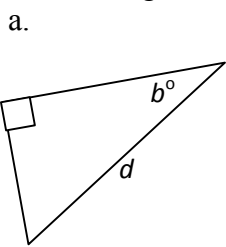
24. Determine the ratio (fraction) for each trigonometric function based on the figure below.

sin 32 =   sin 58 =

cos 32 =   cos 58 =

tan 32 =   tan 58 =

(triangle with J at bottom left, R at bottom right with right angle, M at top right; angle J = 32°, angle M = 58°; side t = JM, side g = MR, side m = JR)
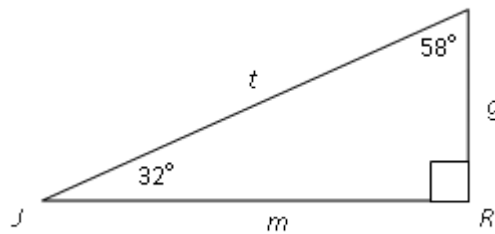
| 25. Suppose the sun casts a shadow off a 35-foot building. What is the angle of elevation to the sun if the shadow is 46-feet long? <u>Include a labeled sketch.</u> Round to the nearest whole number.	26. A person standing at the top of a lighthouse sees a boat 27 feet from the base of a lighthouse. If the angle of depression from the top of the lighthouse to the boat is 65°, how tall is the lighthouse? Round to <u>2 decimal places</u>.

27. A circle has a radius of 12 inches. Find the circumference of the circle to the nearest hundredth.

28. A circle has a diameter of 14 inches. Find the circumference of the circle to the nearest hundredth.

29. Using circle R name the parts of the circle.

    Radius: _____   Diameter: _____

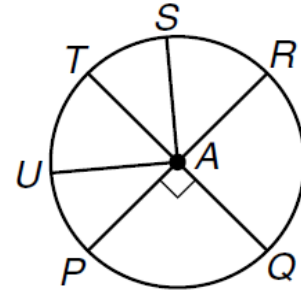   Chord: _____   Tangent line: _____
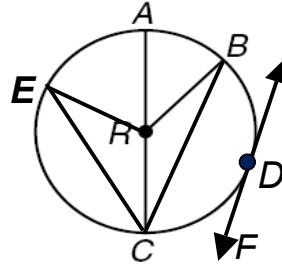
For the next five questions use circle A, where $m\angle UAT = 52°$ and *PR* and *TQ* are diameters.

30. Find $m\angle UAP$

31. Find $m\angle QAU$

32. Find $m\,\overset{\frown}{UT}$
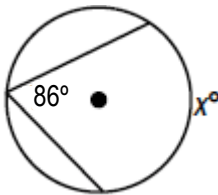
33. Find $m\,\overset{\frown}{RQU}$

34. If *PR* = 24 inches, find the length of *RQ*. Round to the nearest tenth.

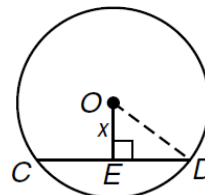35. Find the center and radius of the circle given by the equation: $(x - 5)^2 + (y + 3)^2 = 81$.

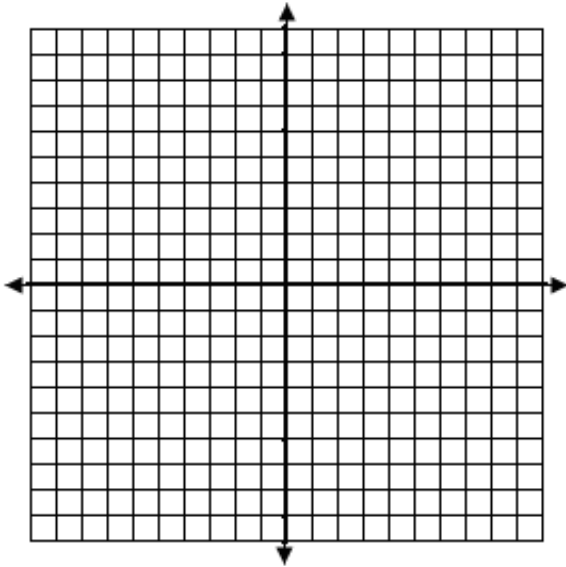   a. Center: _____   Radius: _____

36. Find *x*.
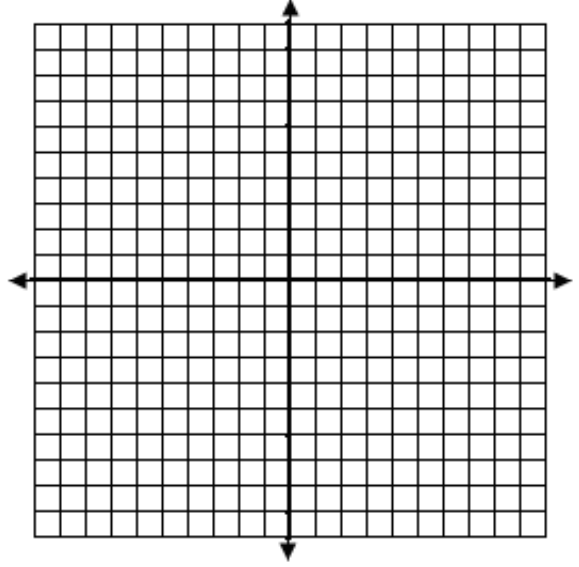
37. In circle O, *OD* = 13 and *CD* = 24. Find *x*.

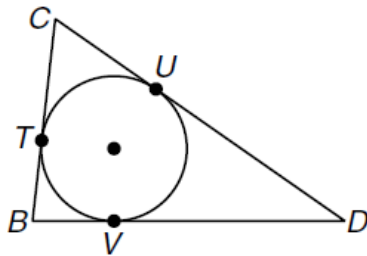38. Graph the circles with the given equations:

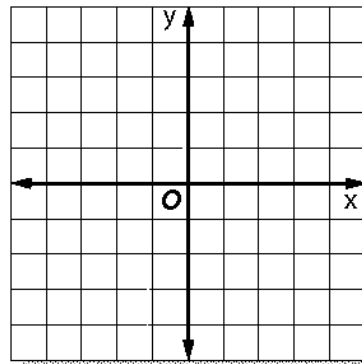| $(x-5)^2 + (y+3)^2 = 16$	$(x-4)^2 + (y-2)^2 = 25$

39. Find the perimeter of $\triangle CBD$ if $CU = 5$, $CD = 14$ and $BD = 12$.

40. Write the equation of the circle whose diameter has enpoints

at (-4, 3) and (2, -1). Use the grid at the right to help visualize
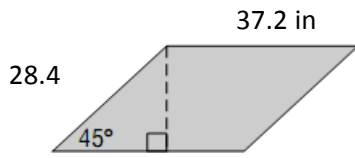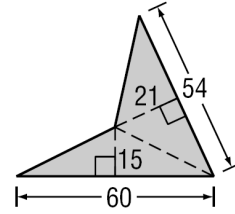
the problem. **Show any calculations.**

Equation: _____

5

Find the area of each figure. Round all answers to the nearest hundredth.

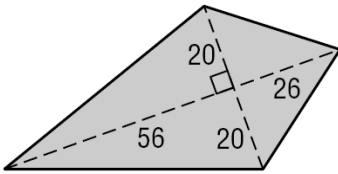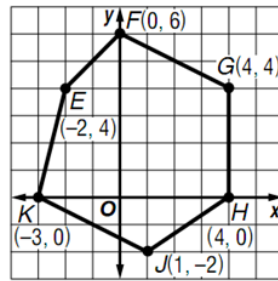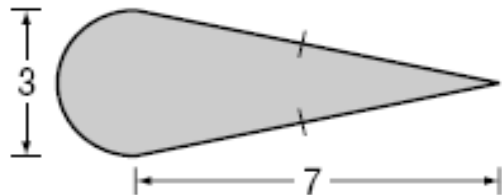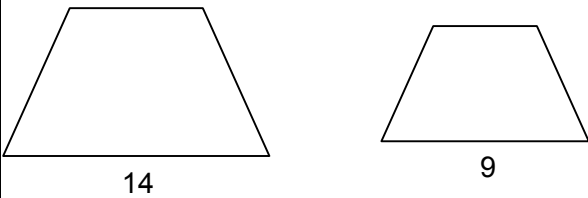|	
41. 37.2 in 28.4 45°	42. 21 54 15 60
43. 20 26 56 20	44. 64 m 20 m 40 m 20 m
45. *y* *M*(0, 3) *L*(−2, 0) *N*(2, 0) *O* *x* *P*(0, −2)	46. *y* *F*(0, 6) *G*(4, 4) *E* (−2, 4) *K* *O* *H* *x* (−3, 0) (4, 0) *J*(1, −2)
47. 40.5 in 16.2 in	48. 3 7

6
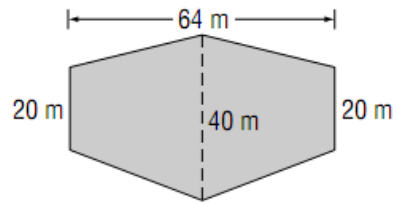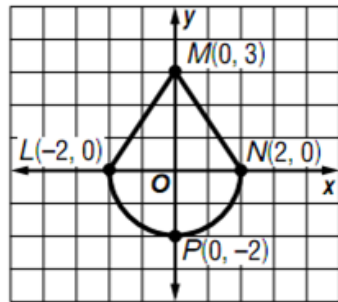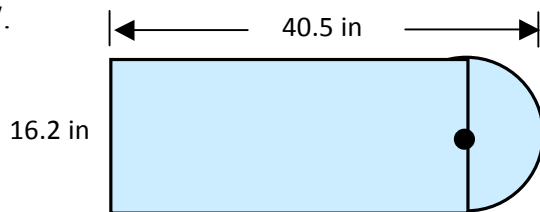
49. The two figures below are similar.

14

9

a) What is the ratio of their perimeters?

b) What is the ratio of their areas?

50. The area of the smaller pentagon is 32.5 cm^2. What is the best approximation for the area of the larger pentagon? Round to the nearest hundredth. (Assume the two pentagons are similar).
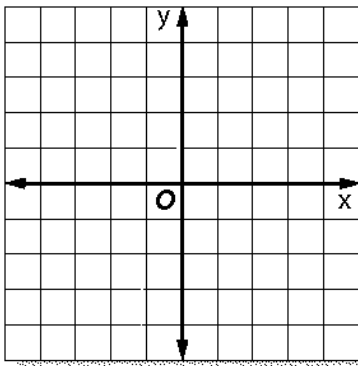
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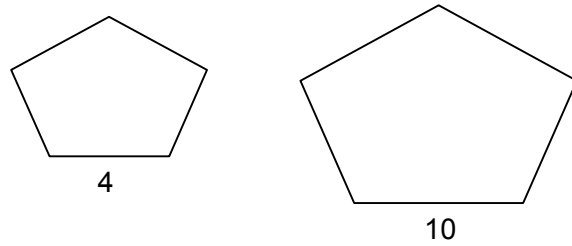
51. Find the exact area of the parallelogram.

12 m

10 m

60°
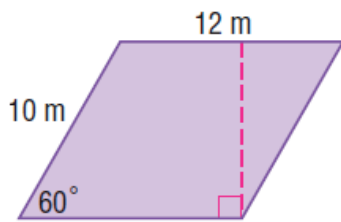
52. A rhombus has an area of 133 cm^2, and the length of one diagonal is 14 cm. Find the length of the other diagonal..
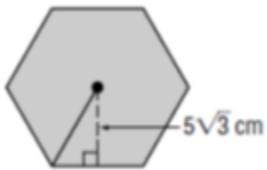
53. Find the perimeter of the rhombus with the coordinates of A(2, 5), B(-1,1), C(2,-3), and D(5, 1).

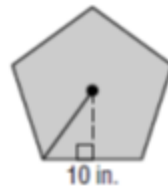54. Trapezoid RSTU has an area of 935 cm^2. Find the height.
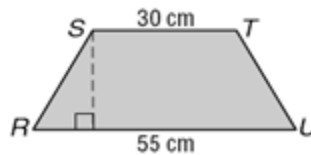
S   30 cm   T

R   55 cm   U

55. Find the area of the figure. Round to the nearest tenth.

$5\sqrt{3}$ cm

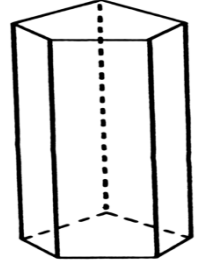56. Find the area of the figure. Round to the nearest tenth.

10 in.

57. Name the figure at the right. Then count the number of faces, edges, and vertices.

    a. Name: _____

    b. # of Faces: _____   c. # of Edges: _____   d. # of Vertices: _____

For the next four problems, write the name of the polygon that matches the specified information.

58. a pyramid with six faces _____

59. a prism with ten faces _____

60. a solid with one base and a total of six faces _____

61. a solid with two bases and a total of five faces _____

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62. Refer to the figure at the right.

  Name the solid: _____

  Draw and label a net for the solid.

12 in.

3 in.

8 in.
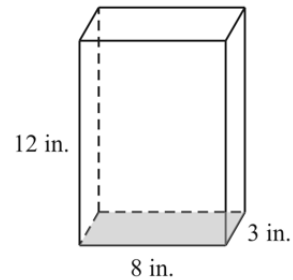
  Compute the surface area of the figure. **Show all calculations.**

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63. Compute the surface area of the figure at the right.
     Round to 2 decimal places if necessary. Show all calculations.

11 cm

16 cm

Surface area = _____

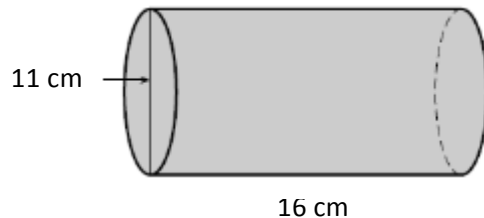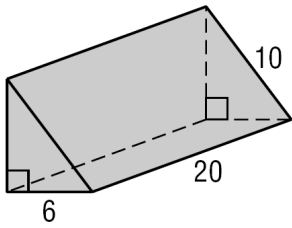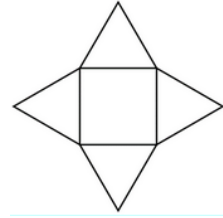64. Find the surface area of the figure below. <u>Show all calculations.</u>

10

20

6

65. Name the solid based on the net that is given.
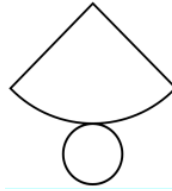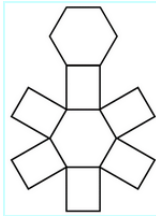
66. A sphere has a radius of 19 centimeters. Find the sphere's volume. Round to <u>2 decimal places</u> if necessary. **<u>Show all calculations.</u>**

67. A hemisphere sphere has a diameter of 18 centimeters. Find the hemisphere's volume. Round to <u>2 decimal places</u> if necessary. **<u>Show all calculations.</u>**

68. Calculate the volume of the hexagonal prism below.

12 in.

6 in.
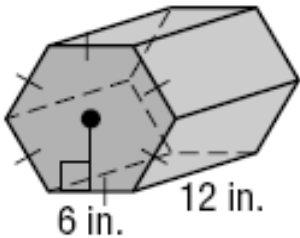
Volume = _____

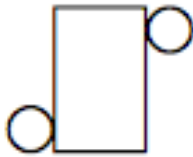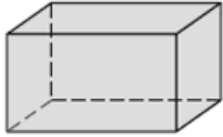|	
69. A rectangular prism has a length of 10 feet, a width of 7 feet, and a height of 2 feet. Find the volume.	70. A cylinder has a diameter of 8 inches and height of 5 inches. Find the volume to the nearest tenth.
71. Find the volume to the nearest tenth. 13 6 12	72. A pyramid with a volume of 226 cm^3 has a height of 12 centimeters. Find the area of the base.
73. Find the volume to the nearest tenth. 6 cm 10 cm	74. A sphere has a diameter that is 6 inches long. Find the volume to the nearest tenth.
75. A cone has a radius of 9 cm and a volume of 54π cm^3. Find the height of the cone.	76. A cone has a radius of 5 cm and a volume of 125π cm^3. Find the height of the cone.
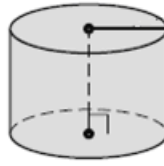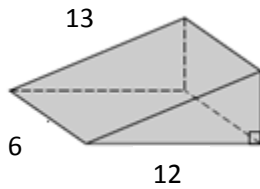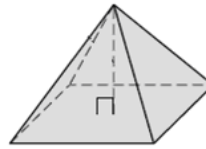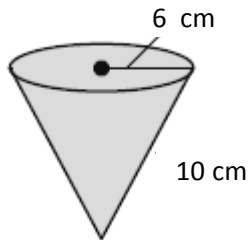
77. Find the volume to the nearest tenth.

9 cm

5 cm
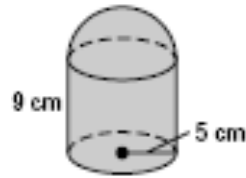
78. Assume the two figures below are similar.
   a. Determine the ratio of their volumes.

6 cm

8 cm

12 cm

15 cm
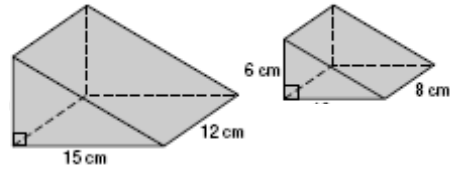
   b. If the volume of the larger figure is 810 cm^3, find the volume of the smaller figure.

79. Decide if the two figures are similar. Justify your answer.
   a)

4

5

3

14 ft

12 ft

12 ft

   b)

4

5

3

8

10

6
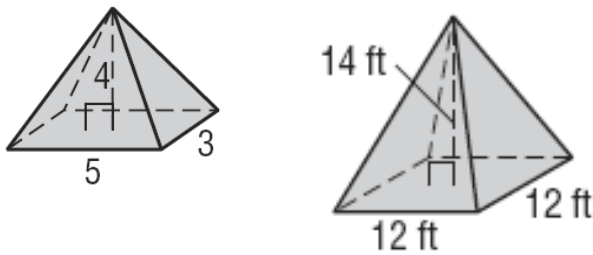
80. Carl purchased seven new shirts and five new pairs of pants. How many new outfits can he make with these items?

81. A clothing store sells belts in 3 colors, 4 designs, and 6 sizes. How many different belts are available?

82. Five children line up to play a game. How many different ways can the children be arranged?

83. The letters a, c, e, g, i, and k are used to form 6-letter passwords for a movie theater security system. How many passwords can be formed if the letters can be used more than once in any given password?
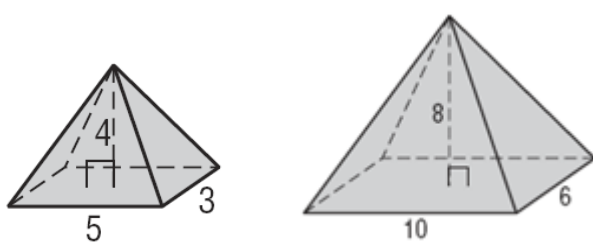
84. How many 4-digit personal identification codes can be formed if each numeral can only be used once?

85. How many ways can 9 bowling balls be arranged on the upper rack of a bowling ball rack?

86. How many different outfits can be made if you choose 1 item each from 11 skirts, 9 blouses, 3 belts, and 7 pairs of shoes?

87. How many different ways can the letters of the word PENTAGON be arranged if the first letter must be "g"?

88. Five cheerleaders will be chosen from a group of 15 students. How many different cheerleading squads can be formed?

89. A standard 6-sided blue die and a standard 6-sided red die are tossed.
      a. What is the probability that a 6 will appear on both dice?

      b. What is the probability that the blue die shows an even number and the red die shows an odd number?

90. Suppose you pick a card from a standard deck. Decide the probability of each situation.
   a. What is the probability that you will pick a club or an ace?

      b. What is the probability that you will pick an ace or a red 2?

      c. What is the probability that you will pick a face card?

91. A jar contains 10 purple marbles and 2 red marbles. If two marbles are chosen at random with no replacement, what is the probability that 2 purple marbles are chosen?

92. A bag contains 6 cherry, 8 strawberry, and 9 grape-flavored candies. What is the probability of selecting a cherry or a grape flavored candy?

93. A standard 6-sided die is rolled. What is the probability of rolling a 6 or a number greater than 4?
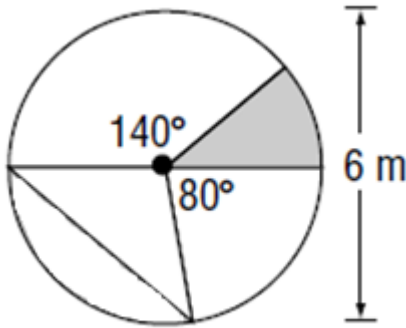
94. Find the probability that a point picked at random will be in the shaded area.
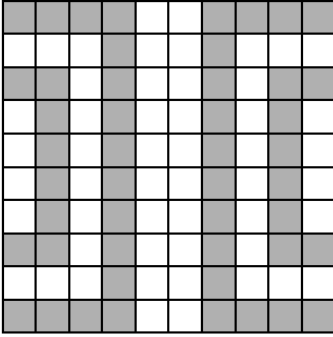
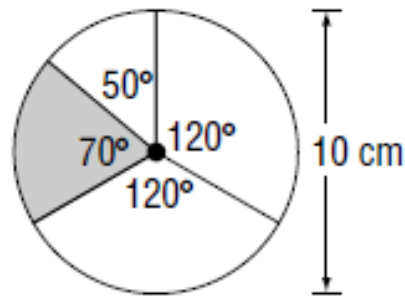95. Find the probability that a point picked at random will be in the shaded area.
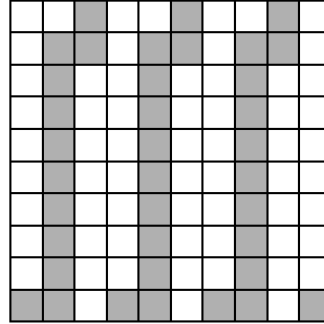
96. Find the area of the shaded sector and the probability that a point picked at random will be in the shaded area. Round to 2 decimal places.

Area: _____

Probability: _____
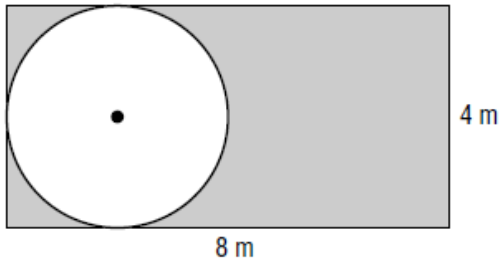
97. Find the area of the shaded sector and the probability that a point picked at random will be in the shaded area. . Round to 2 decimal places.
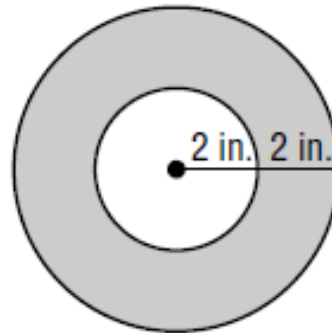

Area: _____

Probability: _____

98. Find the probability that a point picked at random will be in the shaded area. . Round to 2 decimal places.

99. Find the probability that a point picked at random will be in the shaded area.

100. If picked randomly, what is the probability of picking a brown M&M using the table below?

Red	Yellow	Orange	Blue	Green	Brown
0.2	0.2	0.1	0.1	0.1	

101. Find the missing values in the two way table.

| Age of driver | Number of Accidents in a year | | | Total |
	1	2	3	
17-25	15		40	
26-40	50	44		150
Above 40	62	22	11	
Totals		89		

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