$$(Hypotenuse)^2 = (Base)^2 + (Perpendicular)^2$$
$$x^2 = 12^2 + 5^2 = 144 + 25$$
$$x^2 = 169$$
$$\sqrt{x^2} = \sqrt{169}$$
$$x = 13 \, m$$

35. Marble size is $20 \, cm \times 30 \, cm$. How many marbles are required to cover a square with side 3 m? (PP)

Solution:

$$Area \, of \, one \, marble = 20 \, cm \times 30 \, cm$$
$$Area \, of \, one \, marble = 600 \, cm^2$$
$$Floor \, area = 3 \, m \times 3 \, m$$
$$Floor \, area = (3 \times 100) \, cm \times (3 \times 100) \, cm$$
$$Floor \, area = 300 \, cm \times 300 \, cm$$
$$Marbles \, required = \frac{Floor \, area}{Area \, of \, one \, marble}$$
$$Marbles \, required = \frac{300 \times 300}{600}$$
$$Marbles \, required = \frac{300}{2}$$
$$Marbles \, required = 150$$

36. If circumference of a circle is equal to the perimeter of a square whose sides are π, what is the radius of circle? (PP)

Solution:

$$Circumference \, of \, circle = Perimeter \, of \, square$$
$$2\pi r = 4L$$
$$2\pi r = 4\pi$$

$$r = \frac{4\pi}{2\pi}$$

$$r = 2$$

37. If a rectangle has sides 2x and 3x and area of 24, what is the value of x? (PP)

Solution:

$$A = L \times W$$

$$24 = 2x \times 3x$$

$$24 = 6x^2$$

$$x^2 = \frac{24}{6}$$

$$x^2 = 4$$

$$x = 2$$

38. What is volume of a cube whose total surface area is 216 square inches? (PP)

Solution:

We know that surface area of a cube is:

$$S = 6L^2$$

$$216 = 6L^2$$

$$L^2 = \frac{216}{6}$$

$$L^2 = 36$$

$$L = 6$$

We know that volume of a cube is:

$$V = L^3$$

$$V = (6)^3$$

$$V = 216 \; in^3$$

39. The height and base of a triangle are 3 cm and 8 cm respectively. Find area?

Solution:

$$Area\ of\ triangle = \frac{1}{2} \times Base \times Height$$

$$A = \frac{1}{2} \times B \times H$$

$$A = \frac{1}{2} \times 8 \times 3$$

$$A = 12\ (cm)^2$$

40. Find the perimeter of a triangle if its sides are 24 cm, 19 cm and 26 cm? (PP)

Solution:

$$Perimeter\ of\ triangle = Sum\ of\ three\ sides$$

$$P = 24 + 19 + 26$$

$$P = 69\ cm$$

41. Find hypotenuse of a right triangle if base and perpendicular are 4 and 3?

Solution:

$$(Hypotenuse)^2 = (Base)^2 + (Perpendicular)^2$$

$$(H)^2 = (B)^2 + (P)^2$$

$$(H)^2 = (4)^2 + (3)^2$$

$$(H)^2 = 16 + 9$$

$$(H)^2 = 25$$

$$\sqrt{(H)^2} = \sqrt{25}$$

$$H = 5$$

42. How many sides are of a regular heptagon?

Solution:

Seven.

$3\ sides = Triangle$

$4\ sides = Square\ and\ Rectangle$

$5\ sides = Pentagon$

$6\ sides = Hexagon$ (PP)

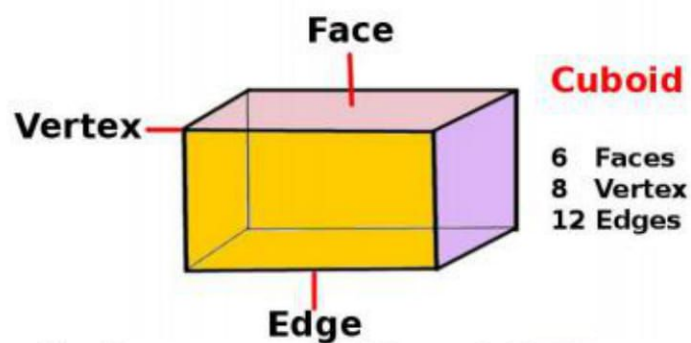$7\ sides = Heptagon$

$8\ sides = Octagon$

$9\ sides = Nonagon$

$10\ sides = Decagon$

43. What are the number of edges of a cuboid? (PP)
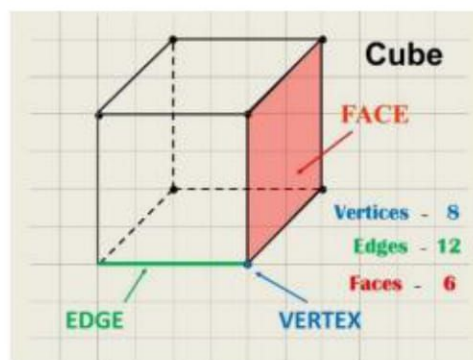
Solution:

Twelve.

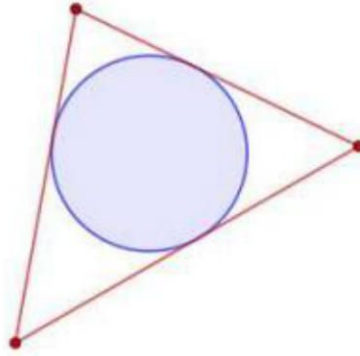44. How many sides/faces are possessed by a cube? (PP)

Solution:

Six.

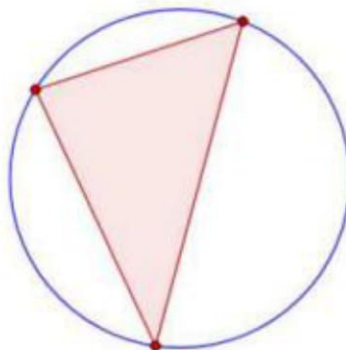**45.** Name that circle which touches the three sides of the triangle internally?

Solution:

In-circle/Inscribed circle.

46. Name that circle which touches the three vertices of the triangle?
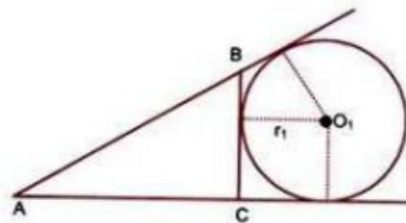
Solution:

Circum-circle/Circumscribed circle.

47. Name that circle which touches two side internally and one side externally?

Solution:
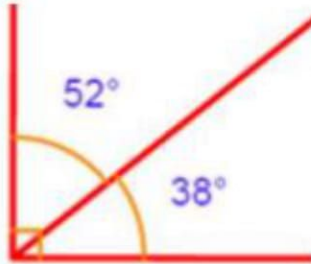
E-circle/X-circle/Escribed circle.

48. If sum of two angles is equals 90 degrees, then those angles are called? (PP)
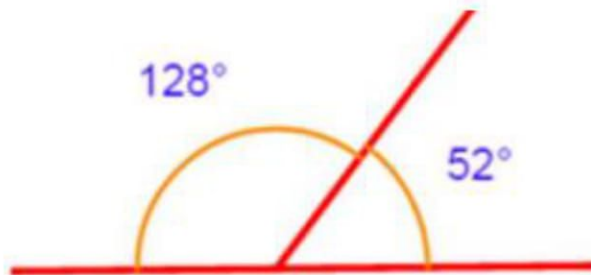
Solution:

Complementary angles.

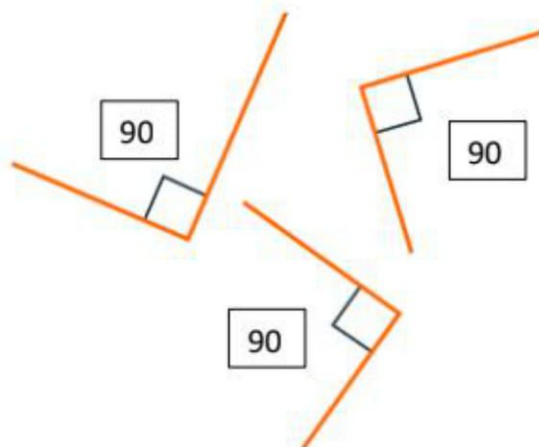**49.** If sum of two angles is equals 180 degrees, then those angles are called? (PP)

Solution:

Supplementary angles.

50. If an angle is equal to 90 degrees, then it is called?
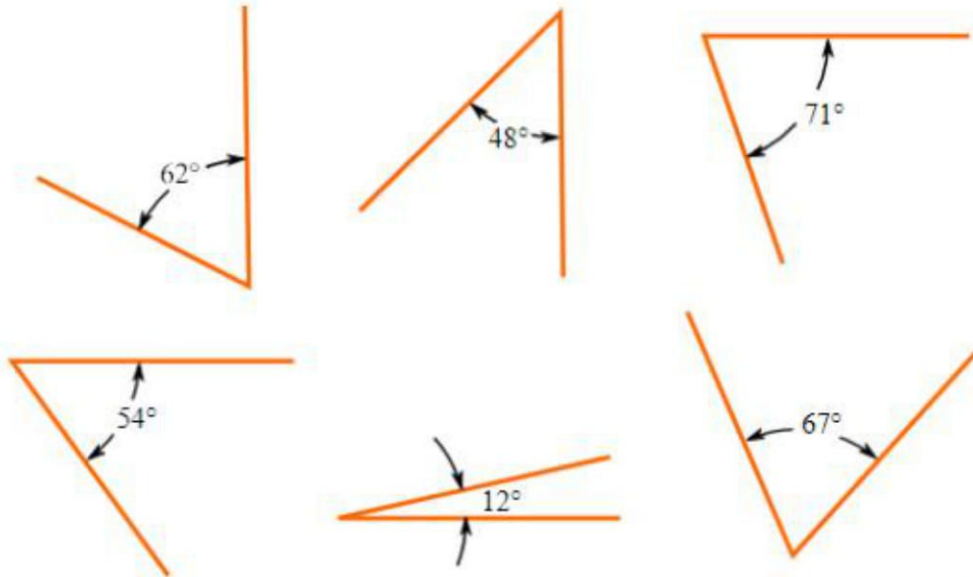
Solution:

Right angle.

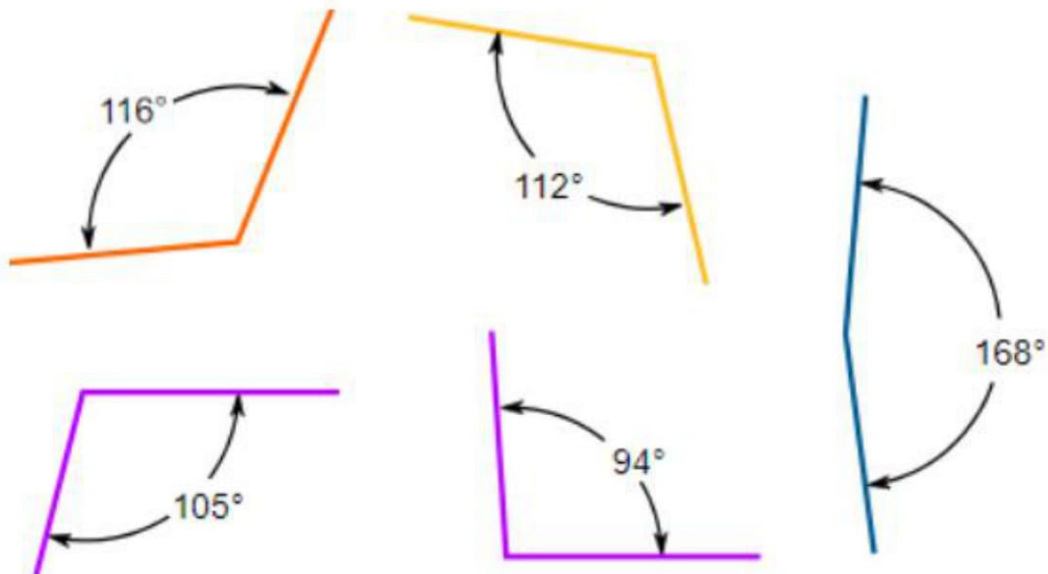**51.** If an angle is less than 90 degrees, then it is called? (PP)

Solution:

Acute angle.

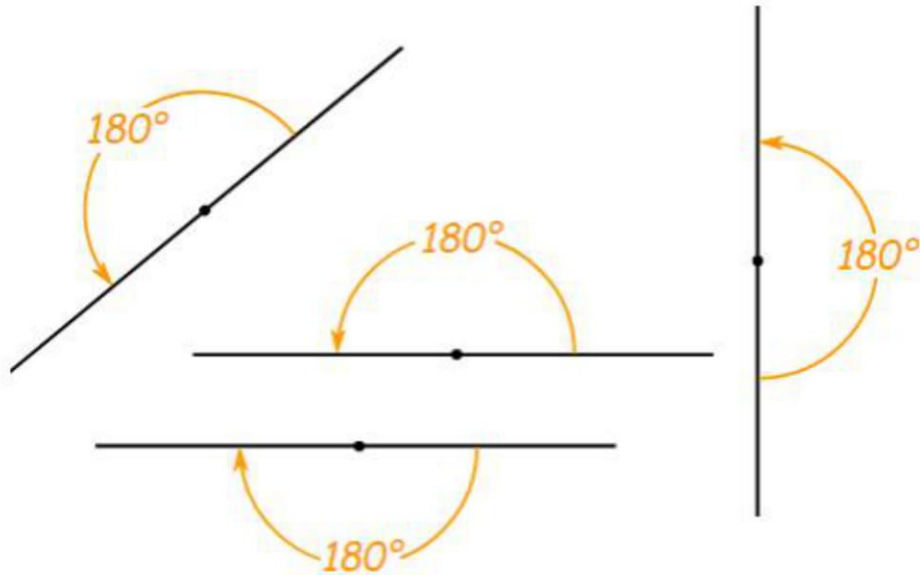**52.** If an angle is between 90 degrees and 180 degrees, then it is called? (PP)

Solution:

Obtuse angle.

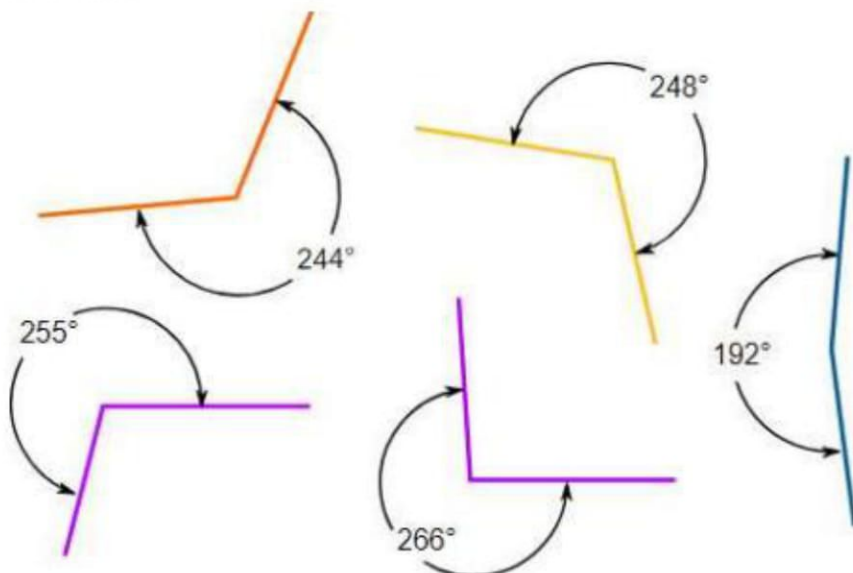**53.** If an angle is equal to 180 degrees, then it is called?

Solution:

Straight angle.

54. If an angle is between 180 degrees and 360 degrees, then it is called?
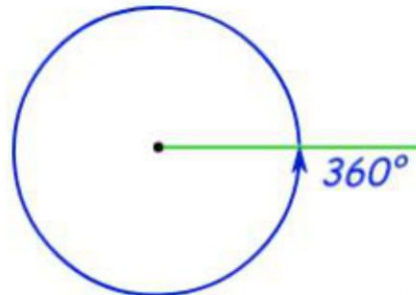
Solution:

Reflex angle.

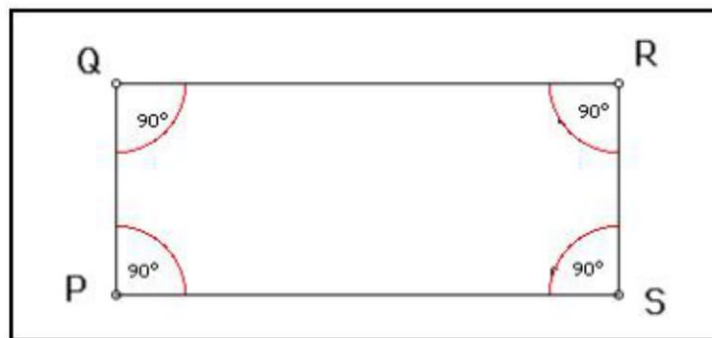**55.** If an angle is equal to 360 degrees, then it is called?

Solution:

Full angle.

360°

56. Sum of all angles of a rectangle and square equal? (PP)
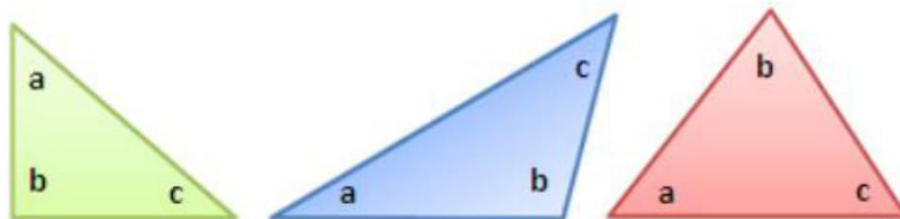
Solution:

360 degrees.

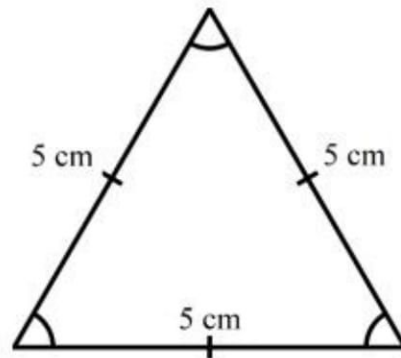**57.** Sum of all angles of a triangle equal? (PP)

Solution:

180 degrees.

$$a + b + c = 180°$$

58. A triangle having all three sides equal in length is called?
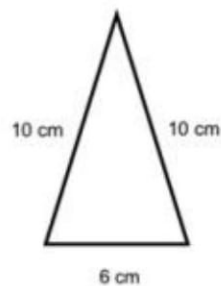
Solution:

Equilateral triangle.

59. A triangle having two sides equal in length is called?

Solution:

Isosceles triangle.

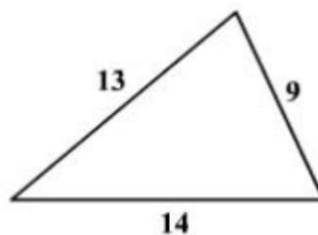**60.** A triangle having no sides equal in length is called?
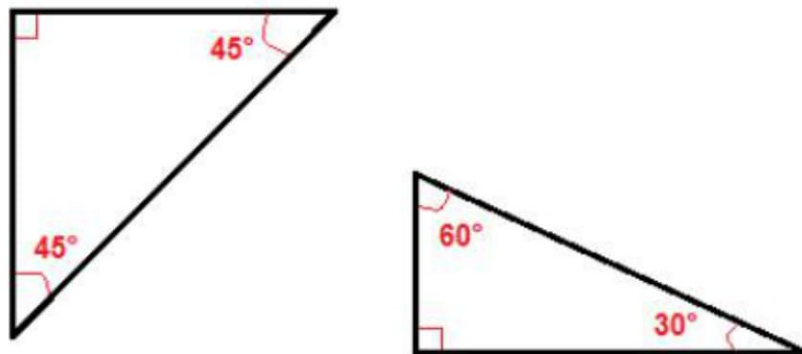
Solution:

Scalene triangle.

61. A triangle having one angle equal to 90 degrees is called? (PP)

Solution:

Right triangle.

62. A triangle having one angle greater than 90 degrees is called?

Solution:

Obtuse triangle.
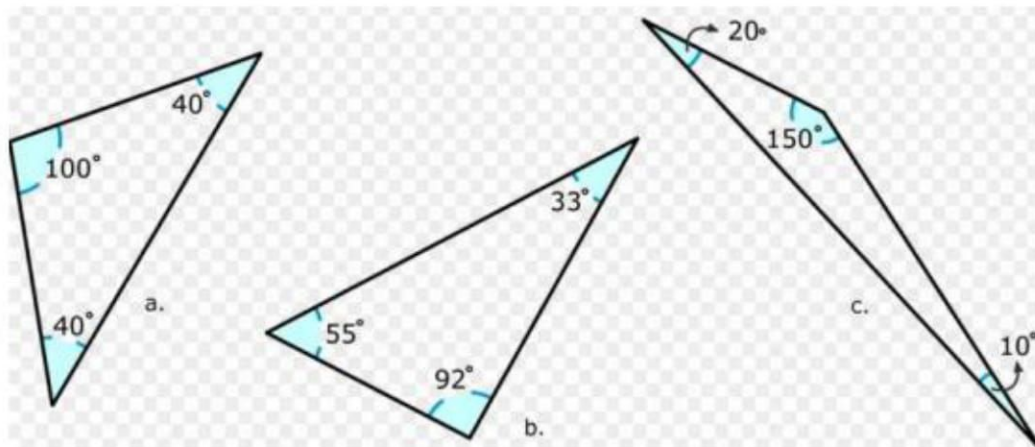
63. A triangle having no angle greater than 90 degrees is called?

Solution:

Acute triangle.
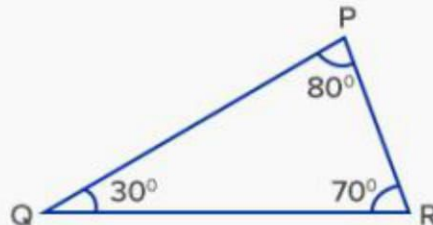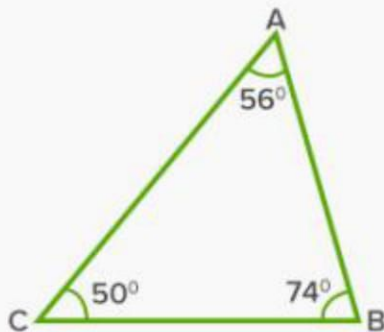
64. What are the angles of an equilateral triangle?

Solution:

60 degrees each.
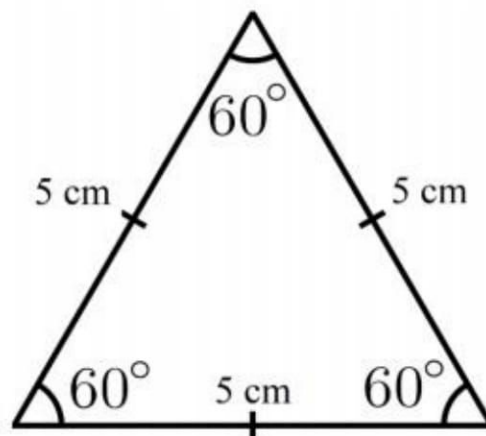
65. How many feet is the distance around a rectangular room that measures 32 feet by 14 feet? (PP)

Solution:

We know that perimeter of a rectangle is given as:

$$P = 2(L + W)$$
$$P = 2(32 + 14)$$
$$P = 2(46) = 92 \, feet$$

66. The length of a rectangle is twice the width. Find its perimeter if the area is 128 cm² ? (PP)

Solution:

$$L = 2W$$
$$A = 128$$
$$L \times W = 128$$
$$2W \times W = 128$$
$$W^2 = 128/2$$
$$W^2 = 64$$
$$W = 8 \; cm$$
$$L = 2W = 2(8) = 16 \; cm$$

We know that perimeter of rectangle is:

$$P = 2(L + W)$$
$$P = 2(16 + 8) = 2(24)$$
$$P = 48 \; cm$$

67. A square is inscribed in a circle with area π, what is the area of the square? (PP)

Solution:

Area of circle = π

From the figure above, we know that:

$$Area\ of\ circle = \pi$$

$$\frac{\pi}{4}d^2 = \pi$$

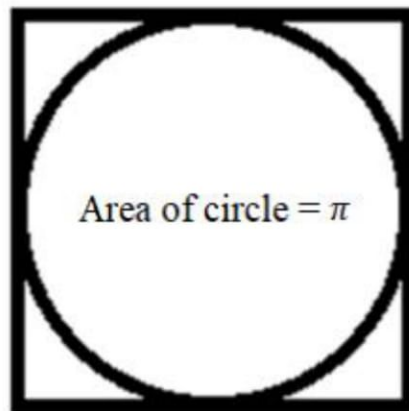$$\frac{d^2}{4} = 1$$

$$d^2 = 4$$

$$d = 2$$

Diameter of circle is the side of the square, so:

$$Area\ of\ suare = (Length\ of\ one\ side)^2$$

$$Area\ of\ suare = (2)^2 = 4$$

68. The ratio of radius of a circle to the side of square is 2 : 11. Find the ratio of their areas? (PP)

Solution:

$$\frac{Radius\ of\ circle}{Side\ of\ square} = \frac{2}{11}$$

We know that:

$Area\ of\ circle = \pi r^2$

$Area\ of\ circle = \pi(2)^2$

$Area\ of\ circle = 4\pi$

We know that:

$Area\ of\ suare = (L)^2$

$Area\ of\ suare = (11)^2$

$Area\ of\ suare = 121$

$$Ratio = \frac{Area\ of\ circle}{Area\ of\ square}$$

$$Ratio = \frac{4\pi}{121}$$

69. Perimeter of a triangle is 16 and lengths of two sides are 5 and 6. Find the area of triangle? (PP)

Solution:

When sides of the triangle are given and area is asked, then we use Hero's formulas, and it is given as:

$$\Delta = \sqrt{s(s-a)(s-b)(s-c)}$$

Where:

$$\Delta = Area\ of\ triangle$$

$$s = \frac{a+b+c}{2}$$

$$a,b,c = Three\ sides$$

In this question, $a = 5$, $b = 6$, and $c = P - a - b = 16 - 5 - 6 = 5$, so:

$$s = \frac{a+b+c}{2} = \frac{5+6+5}{2} = \frac{16}{2} = 8$$

$$\Delta = \sqrt{8(8-5)(8-6)(8-5)}$$

$$\Delta = \sqrt{8(3)(2)(3)}$$

$$\Delta = \sqrt{144} = 12$$

70. Find the diameter of a circle if a 7 x 5 rectangle is inscribed in it? (PP)

Solution:
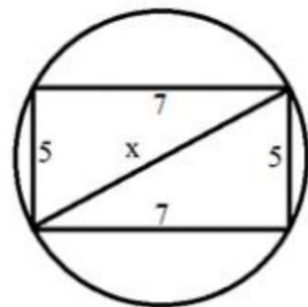
$$(Hypotenuse)^2 = (Base)^2 + (Perpendicular)^2$$

$$x^2 = 7^2 + 5^2 = 49 + 25$$

$$x^2 = 74$$

$$\sqrt{x^2} = \sqrt{74}$$

$$x = \sqrt{74}$$

71. If the area of a square of side x is 5, what is the area of a square of side $3x$? (PP)

Solution:

We know that:

$$Area\ of\ square = x \times x = 5$$
$$x^2 = 5$$
$$\sqrt{x^2} = \sqrt{5}$$
$$x = \sqrt{5}$$

Multiplying both sides with "3", we get:

$$3x = 3\sqrt{5}$$

Area of new square will be:

$$Area = 3x \times 3x$$
$$Area = 3\sqrt{5} \times 3\sqrt{5}$$
$$Area = 45$$

72. Length of a square is increased by 8 cm. Its area becomes 400 sq. cm. Find its perimeter? (PP)

Solution:

Let L be the length of a square. Given that length is increased by 8 cm, hence new length will be $L + 8$. Now, area will be:

$$(L + 8) \times (L + 8) = 400$$
$$(L + 8)^2 = 400$$
$$\sqrt{(L + 8)^2} = \sqrt{400}$$
$$L + 8 = 20$$
$$L = 20 - 8 = 12$$

We know that perimeter of square is:

$$Perimeter\ of\ square = 4L$$
$$Perimeter\ of\ square = 4 \times 12$$
$$Perimeter\ of\ square = 48\ cm$$

73. A square with sides of length 3 is intersected by a line at S and T. What is the maximum possible distance between S and T? (PP)

Solution:

The line which intersects the square at the maximum possible distance is the diagonal of the square as shown in the figure:
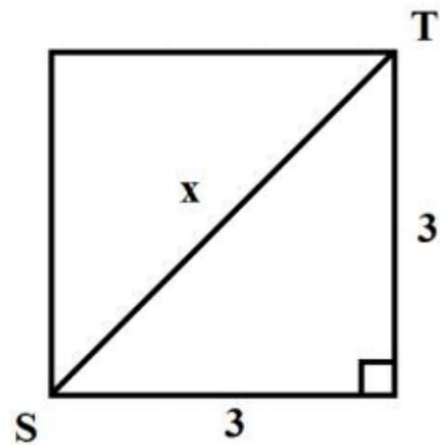
By using Pythagoras theorem, we get:

$$x^2 = 3^2 + 3^2 = \sqrt{9+9}$$

$$x = \sqrt{18} = \sqrt{2 \times 3 \times 3}$$

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

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

74. The perimeter of a right triangle is $90\ cm$ and its area is $180\ cm^2$. Find its hypotenuse? (PP)

Solution:

$$Perimeter = b + h + p = 90$$

$$b + p = 90 - h \dots (Eq.\,1)$$

$$Area = A = \frac{1}{2} \times b \times p = 180$$

$$b \times p = 360 \dots (Eq.\,2)$$

From Pythagoras theorem, we get:

$$b^2 + p^2 = h^2 \dots (Eq.\,3)$$

Squaring equation (1), we get:
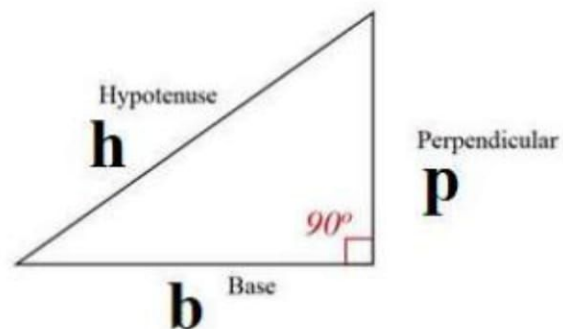
$$(b + p)^2 = (90 - h)^2$$

$$b^2 + p^2 + 2bp = 8100 - 180h + h^2$$

Substituting the values from equation (3) and equation (2), we get:

$$h^2 + 2(360) = 8100 - 180h + h^2$$

$$720 = 8100 - 180h$$

$$180h = 8100 - 720$$

$$180h = 7380$$

$$h = \frac{7380}{180} = 41\ cm$$

75. Find the area and perimeter of right triangle with base $3\ cm$ and height $4\ cm$?

(PP)

Solution:

In this right triangle, we have:

$$Base = b = 3\ cm \qquad Height = Perpendicular = p = 4\ cm$$

From Pythagoras theorem, we have:

$$h^2 = b^2 + p^2$$

$$h = \sqrt{(3)^2 + (4)^2} = \sqrt{9 + 16} = \sqrt{25} = 5\ cm$$

We know that area of a right triangle is:

$$A = \frac{1}{2} \times b \times p = \frac{1}{2} \times 3 \times 4 = \frac{1}{2} \times 12 = 6\ cm^2$$

We know that perimeter of a right triangle is:

$$P = b + p + h = 3 + 4 + 5 = 12\ cm$$