10th Grade Mathematics

Reference Sheet

10ᵗʰ Grade Mathematics Reference Sheet

GEOMETRIC FORMULAS
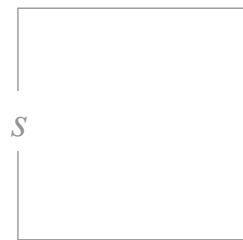
Perimeter of rectangle

$$2l + 2w = P$$

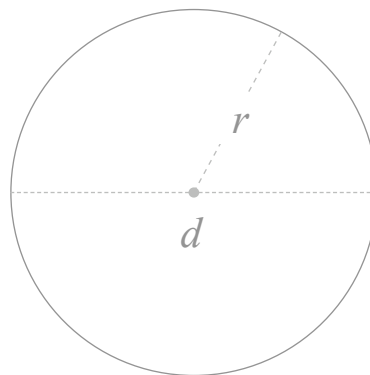w

l

Perimeter of square

$$4s = P$$

s

Circumference of circle
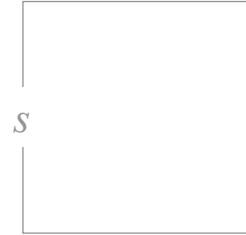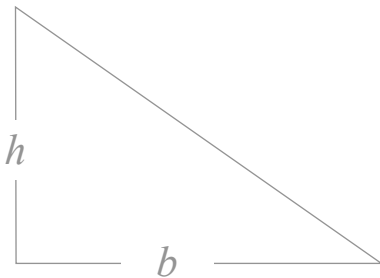
$$2\pi r = C$$
$$\pi d = C$$

r

d

Area of rectangle
$$lw = A$$

w

l

Area of square
$$s^2 = A$$

s

Area of triangle
$$\frac{1}{2}\,bh = A$$

h

b

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

r

d
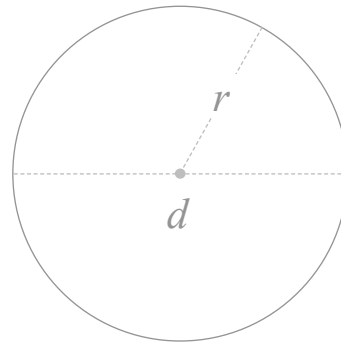
Area of trapezoid
$$\frac{1}{2}\,h(b_1 + b_2) = A$$
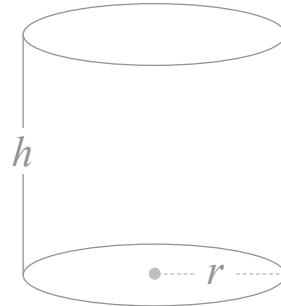
b_1

h

b_2
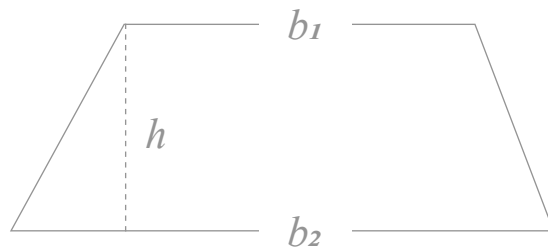
Surface Area of rectangular prism
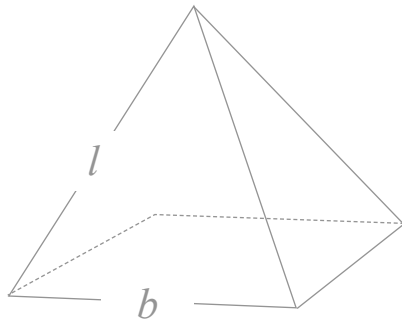
$$2B + Ph = SA$$

Surface Area of right cylinder
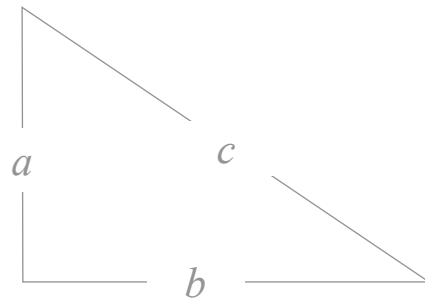
$$2\pi rh + 2\pi r^2 = SA$$

Surface Area of right pyramid

$$\frac{1}{2}\,l\,P + 2B = SA$$

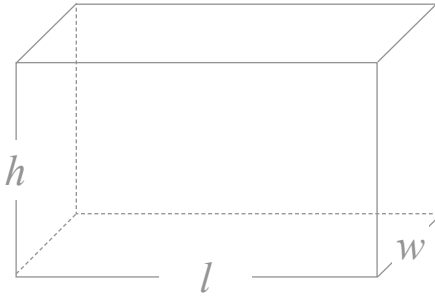## Pythagorean Theorem

$$a^2 + b^2 = c^2$$

To calculate distance traveled

$$d = rt$$

DISTANCE = RATE x TIME

Volume of rectangular prism

$$lwh = V$$

Volume of right pyramid

$$\tfrac{1}{3}Bh = V$$
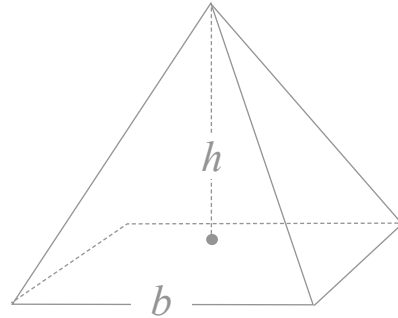
Volume of right cylinder

$$\pi r^2 h = V$$
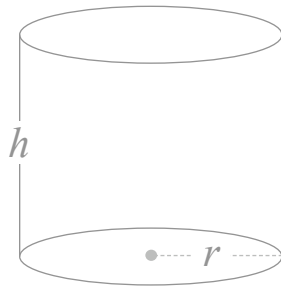
Volume of cone

$$\tfrac{1}{3}\pi r^2 h = V$$

Volume of sphere

$$\tfrac{4}{3}\pi r^3 = V$$

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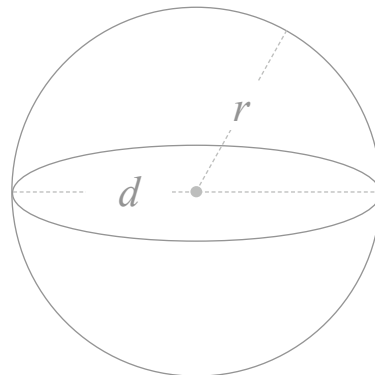
Special Right Triangles
30°-60°-90°

$S\text{-}s\sqrt{3}\text{-}2s$

A

60°

25

s

90°

30°

B ←——— $s\sqrt{3}$ ——→ C
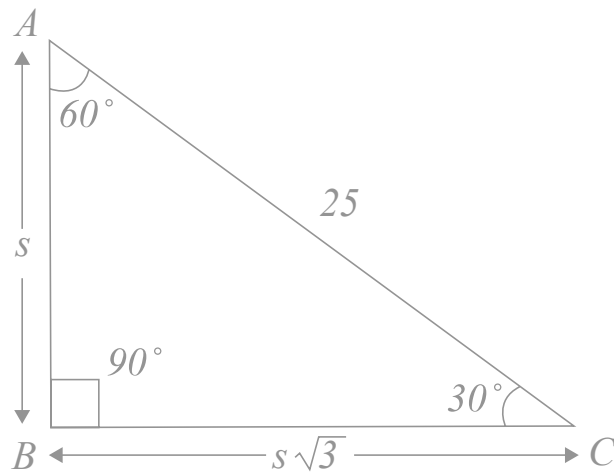
Special Right Triangles
45°-45°-90°

$s\text{-}s\text{-}s\sqrt{2}$

45°

$s\sqrt{2}$

s

45°

90°

s
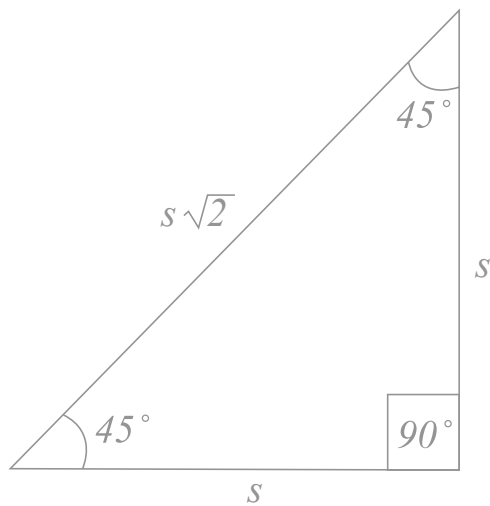
Equation of a Circle

$$(x-h)^2+(y-k)^2=r^2$$
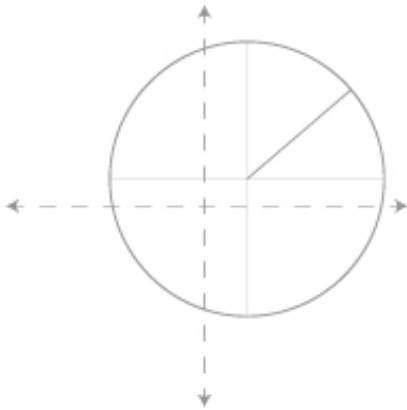
Slope Formula

$$m= y_2-y_1 / x_2-x_1$$

(x_2 , y_2)

(x_1 , y_1)
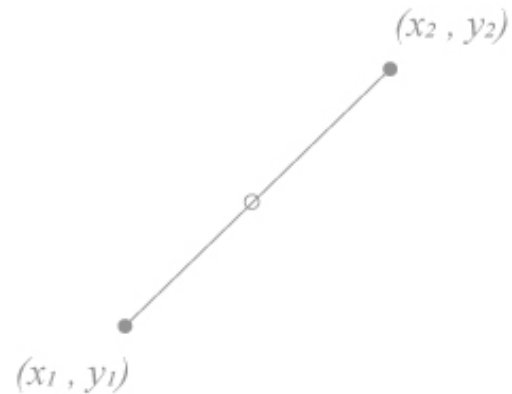
Midpoint Formula

$$(x_1+x_2/2 , y_1+y_2/2)$$
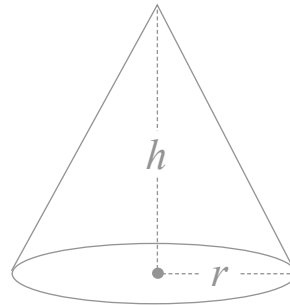
(x_2 , y_2)

(x_1 , y_1)
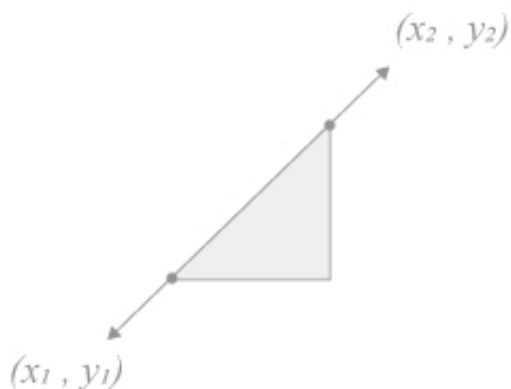
Distance Formula

$$\sqrt{(x_2-x_1)^2 + (y_2-y_1)^2}$$

$$d = \sqrt{(x_2 - x_2)^2 + (y_2 - y_2)^2}$$

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Quadratic Formula

$$\text{When } ax^2 + bx + c = 0, \text{ then}$$

$$X = \frac{-b \pm \sqrt{b2 - 4ac}}{2a}$$

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Equivalence

$$a^x = y \leftrightarrow \log_2 y = x$$
$$e^x = y \leftrightarrow \ln y = x$$

Log of a product

$$\log_a x - y = \log_a x + \log_a y$$
$$\ln x - y = \ln x + \ln y$$

Log of a quotient

$$\log_a \tfrac{x}{y} = \log_a x = \log_2 y$$
$$\ln \tfrac{x}{y} = \ln x = \ln y$$

Log of a power

$$\log_a x^n = n\log_a x$$
$$\ln x^n = n\ln x$$

Log of a reciprocal

$$\log_a \tfrac{1}{x} = -\log_a x$$
$$\ln \tfrac{1}{x} = -\ln x$$

Log of the base

$$\log_a a = 1$$
$$\ln e = 1$$

Log of 1

$$\log_a 1 = 0$$
$$\ln 1 = 0$$

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Parabolas

$$y - k = a(x - h)^2$$
$$x - h = a(y - k)^2$$

Circle

$$(x - h)^2 + (y - k)^2 = r^2$$

Ellipse

$$\frac{(x - h)^2}{a^2} + \frac{(y - k)^2}{b^2} = 1$$

Hyperbola

$$\frac{(x - h)^2}{a^2} - \frac{(y - k)^2}{b^2} = 1$$

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CONVERSION FACTORS

UNITS
12 inches = 1 foot
3 feet = 1 yard
5,280 feet = 1 mile
8 fl oz = 1 cup
2 cups = 1 pint
2 pints = 1 quart
4 quarts = 1 gallon
16 oz = 1 pound
2, 000 pounds = 1 ton

UNITS OF TIME
60 seconds = 1 minute
60 minutes = 1 hour
24 hours = 1 day
7 days = 1 week
52 weeks = 1 year = 365 days

METRIC CONVERSIONS

10 millimeters = 1 centimeter	10 milliliters = 1 centiliter	10 milligrams = 1 centigram
100 centimeters = 1 meter	100 centiliters = 1 liter	100 centigrams = 1 gram
1,000 meters = 1 kilometer	1,000 liters = 1 kiloliter	1,000 grams = 1 kilogram

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