Dear Incoming Geometry Students,

This packet is designed to prepare for your grade 8 geometry course. The expectation is that all students bring the completed assignment to their first math class of the 2018-2019 school year.

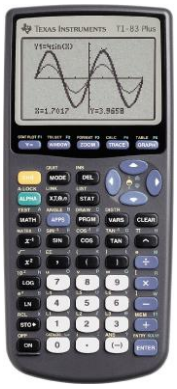
What if I have trouble with the packet?

Don't be discouraged if you see problems that you have not learned how to solve. There is an expectation that you will review the instructional resources and attempt the problems. If you need help completing any problems, you can click the blue links contained in the electronic version of this document. You can also email Mr. Hillman with questions at hillmanl@norwalkps.org.

Please keep in mind that non-calculator problems need to be completed without the use of any type of calculator.

All answers must be justified by showing all work.

A TI-83(plus) or 84(plus) graphing calculator will be necessary to complete the calculator section. All high school mathematics courses will use this type of calculator. **Therefore, it is strongly recommended that every student obtain his or her own calculator.**



TI-83 Plus

TI-84 Plus

SECTION A  NON-CALCULATOR

- **Show all work to justify your answers.**
- **Circle any problems that you don't understand.**

Find the Greatest Common Factor (GCF) and Least Common Multiple (LCM).

1. 36 and 42

GCF = _____ LCM = _____

2. $3x^2$ and $6x$

GCF = _____ LCM = _____

Simplify each expression.

3. $(-10) - (-3)$

answer: _____

4. $6(2x - 4y)$

answer: _____

5. $5y + 5y + 5y$

answer: _____

6. $4x - 5 - 2x - 4$

answer: _____

Simplify each expression.

7. $5 - |-12|$

answer: _____

8. $-7 + 6 + [-5(2 - 3)]$

answer: _____

9. $-3 + 4 - 5(-2 + 8) - 4^2$

answer: _____

10. Evaluate when x = -6 and y = 11

$$\frac{xy}{x+y}$$

answer: _____

11. Make an input-output table to represent the function $y = 5x + 6$.

Use 1, 2, 3, 4, and 5 as the domain.

x	y

12. Write a variable expression for "7 divided by the sum of x and 5."

answer: _____

13. Solve for x.

$$3x - 5 = 13$$

answer: _____

14.

$$\frac{x}{2} = 5$$

answer: _____

15. Solve for x.

$$\frac{5}{4}x - 2 = 33$$

answer: _____

16. Solve for x.

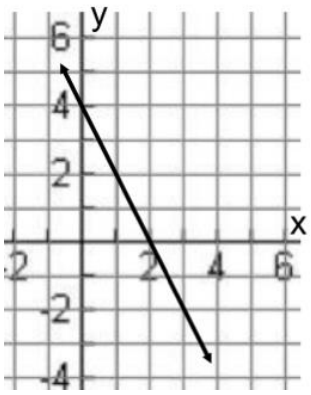
$$3\,(\,x\,+\,5\,)\,=\,8x$$

17. Solve for x.

$$\frac{3x}{4} = \frac{15}{2}$$

answer: _____ | answer: _____

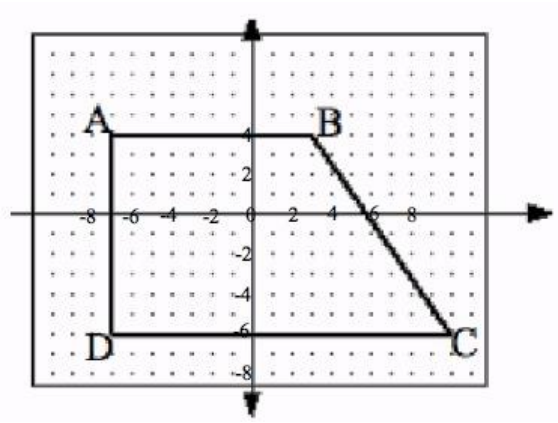
18. Find the slope of each line:



a. The line shown on the right. _____

b. The line that passes through the points $(2,\ 6)$ and $(-3,\ 7)$. _____

19. a. Name the coordinates of points A, B, C and D in the figure on the right.



A_____ B_____ C_____ D_____

b. What type of quadrilateral is shown?_____

c. Find the slope of each line segment:

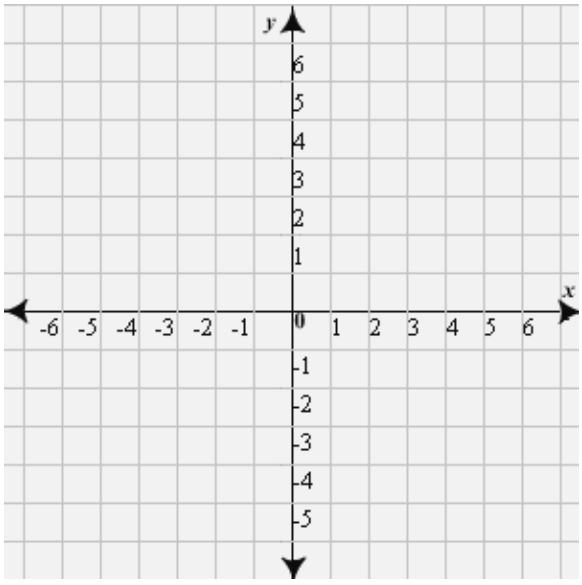
AB _____ AD _____ BC _____

20.

a. Write an equation of the line that has a slope of 3 and a y-intercept of -5.

equation: _____

b. Graph the line from part (a)



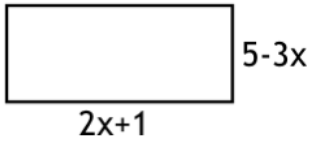
c. What is the x-intercept of the graph?

answer: _____

21. Write the equation of a line in point-slope form if the line has a slope of ½ and passes through the point (7, 5).

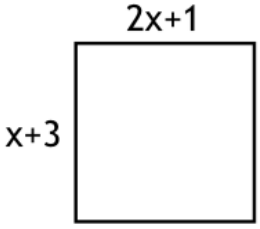
answer: _____

22. Write an algebraic expression that represents the perimeter of the rectangle on the right. Simplify your expression.



simplified expression: _____

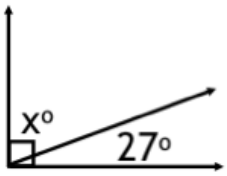
23. The figure on the right is a square. Write and solve an equation to find the value of x.



equation: _____

x = _____

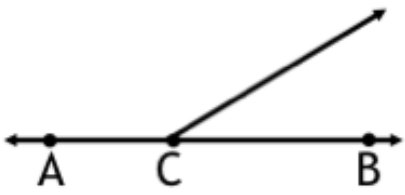
24. If a right angle measures 90°, write an equation in terms of *x* that shows a relationship for the two angles shown on the right. Then solve for *x*.



equation: _____

x = _____

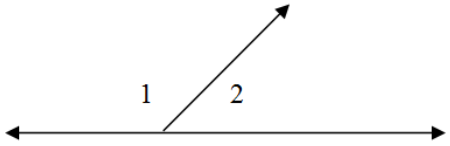
25. The two angles on the right form $\overleftrightarrow{AB}$. If one of the angles is three times larger than the other, solve to find the measure of each angle.



answers: _____ and _____

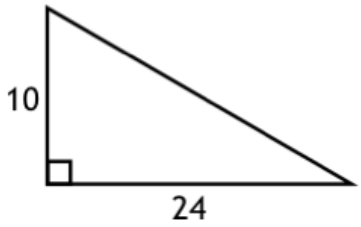
26. Which term describes ∠1 and ∠2 shown on the right?

a)	b)	c)	d)
complementary	supplementary	vertical	opposite



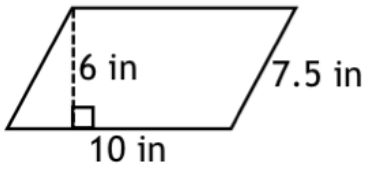
27. Find the missing side of the triangle.

answer: _____



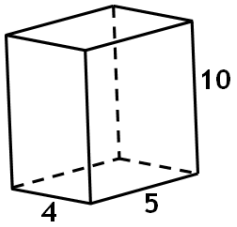
28. Find the area of the parallelogram. (Use $A = b \cdot h$)

answer: _____



29. Find the volume of the figure shown. (Use $V = lhw$)

answer: _____

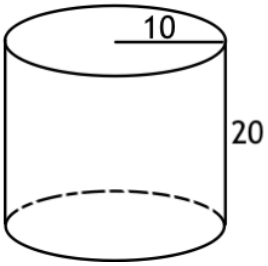


30. Find the area of a circle that has a radius of 21 cm. (Use the formula $A = \pi r^2$, and use the approximation $\pi = \frac{22}{7}$.)

answer: _____

31. Find the volume of the cylinder on the right. (Use the formula $V = \pi r^2 h$, and use the approximation $\pi = \frac{22}{7}$.)

answer: _____



Before you finish this section, make sure that you:

- Showed all your work
- Circled the problems that you didn't understand

SECTION B  NON-CALCULATOR

- **Show all work to justify your answers.**
- **Circle any problems that you don't understand.**

32. Evaluate the following expression when x = −2:

$$-x^2 + x$$

answer: _____

33. Evaluate the following expression when a = −4, b = 3 and c = 1:

$$\sqrt{b^2 - 4ac}$$

answer: _____

Simplify each expression

34.

$$5y \bullet 5y \bullet 5y$$

answer: _____

35.

$$(3x)(-4y)(-5)$$

answer: _____

36. Tom has $45 in his bank account and plans to save $15 every month.

a. Write an algebraic expression, using m, that models how much he has saved in *m* months.

answer: _____

b. Determine how much money Tom will have in his account in 9 months.

answer: _____

c. Tom is planning on buying a new cell phone. When will Tom have $200 saved in his account?

answer: _____

Solve for x

37. $\frac{3}{x} = 6$

answer: _____

38. $0.6x + 2 = 5$

answer: _____

Solve for x.

39. $|x| = 8$

answer: _____

40. $\frac{2x-2}{4} = \frac{x+1}{3}$

answer: _____

41. $\sqrt{x} = 4$

answer: _____

42. Solve for *b* in the formula:

$A = \frac{1}{2}bh$

answer: _____

43. Solve for l in the formula:

$P = 2l + 2w$

answer: _____

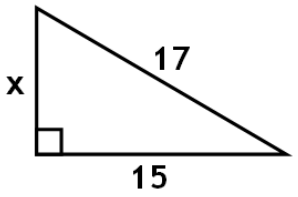
44. Solve for *r* in the formula:

$c = 2\pi r$

answer: _____

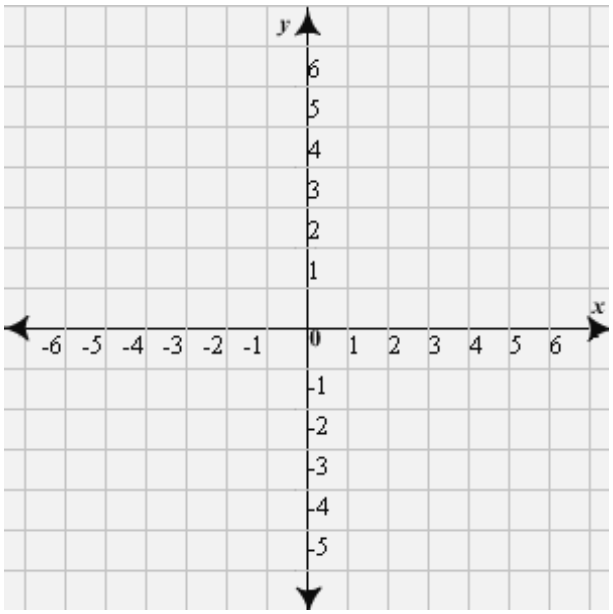
45. Find the value of x.

x = _____



46. Sketch the linear graphs of $x = -3$ and $y = 4$.
Find the point at which the two graphs intersect.

intersection: _____



Solve each system of equations by finding the values of x and y.

47.
$y = 2x$
$40x = 3y - 12$

x = _____ y = _____

48.
$2x + 3y = 6$
$x - 3y = -15$

x = _____ y = _____

49.
$2x - 7 = 11y$
$3x = 19y - 7$

x = _____ y = _____

Simplify each expression.

50. $(x - 3)(4x + 5)$

answer: _____

51. $x^2(2x^3 + 3x + 1)$

answer: _____

52. $(5x^3 - 2x^2 + 7x - 3) - (7x^3 - 3x^2 + 1)$

answer: _____

Before you finish this section, make sure that you:

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- Circled the problems that you didn't understand

SECTION C  NON-CALCULATOR

- **Show all work to justify your answers.**
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Simplify with positive exponents.

53. $\dfrac{x^{-2}y^{3}}{xy^{-5}}$

answer: _____

54. $x^{-3}x^{3}$

answer: _____

55. x^{-5}

answer: _____

56. The circumference of a circle is 12π cm^2. Find the area of the circle in terms of π.

answer: _____

57. The area of a circle is 72π cm^2. Find the radius.

answer: _____

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SECTION D CALCULATOR

- **Show all work to justify your answers.**
- **Circle any problems with which you have difficulty.**

58. The Fahrenheit and Celsius scales are related by the equation: $F = 1.8\,C + 32$

What would the temperature 92˚F be in Celsius? Write the answer to the nearest whole degree.

answer: _____

59. Using the formula, $V = lwh$, calculate the volume (in cubic cm) of a fish tank that is 72.3 centimeters long, 48.2 centimeters wide, and 36 centimeters high.

answer: _____

60. The simple interest I on an investment of P dollars at an interest rate of r for t years is given by $I = Prt$. Find the time it would take to earn $1783 in interest on an investment of $19,000 at a rate of 6.2%.

answer: _____

61. A basketball team scored the following amount of points in the first 7 games of this year's season : 65 57 48 103 97 57 95

a. What is the mean? _____

b. What is the median? _____

c. What is the mode? _____

62. Find the circumference of the circle that has a radius of 6.3cm.
*Note: The circumference of a circle = $\pi \cdot d$, where d = the diameter. (Use the approximation $\pi = 3.14$)

answer: _____

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SECTION E CALCULATOR

- **Show all work to justify your answers.**
- **Circle any problems with which you have difficulty.**

63. The following scatter plot and table show ten employees' work experience and income. Find a best-fit line equation that models this relationship.

answer: _____

Figure 8: Scatter Plot for Sample Data

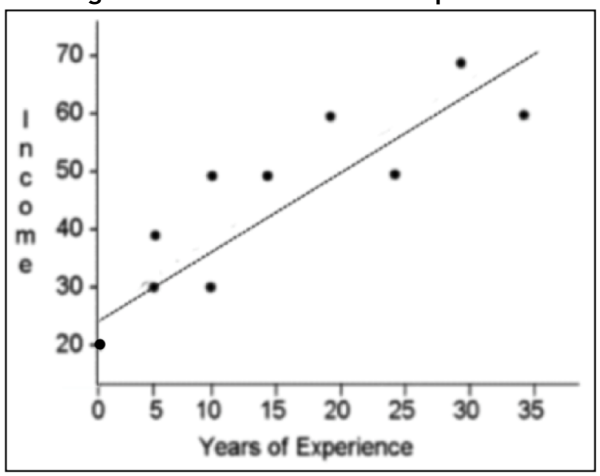


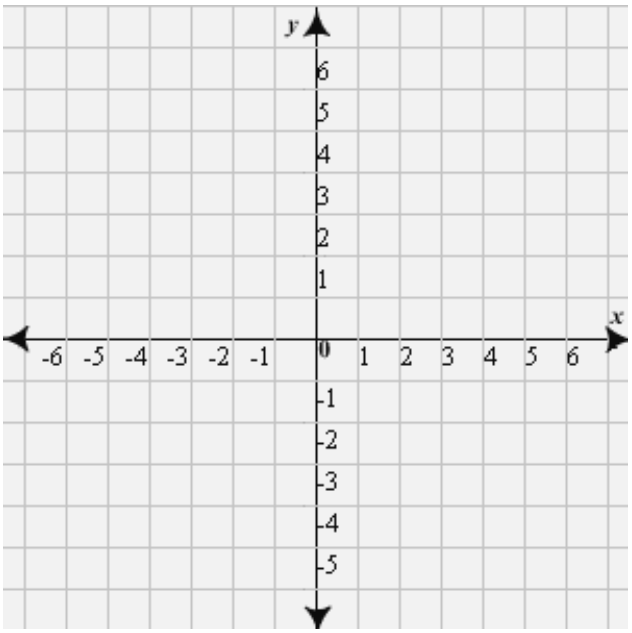
Table 8. : Sample Correlation Data

Subject Number	Experience in Years	Income in Thousands
1	0	20
2	5	30
3	5	40
4	10	30
5	10	50
6	15	50
7	20	60
8	25	50
9	30	70
10	35	60

64. Use your graphing calculator to graph both linear equations on the same axis:

$$y = 2x - 1$$
$$y = -\frac{1}{2}x + 1$$

Graph these same lines on the coordinate plane on the right.



Use your calculator to find the coordinates of the intersection.

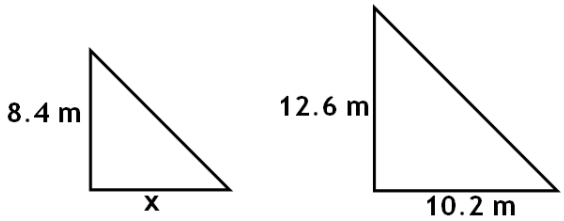
intersection: _____

65. The area of a square parking lot is 368.64 m^2. What is the length of one side of the lot?

answer: _____

66. The two triangles are similar. Find the base, *x*, of the smaller triangle. (m represents meters)

answer: _____



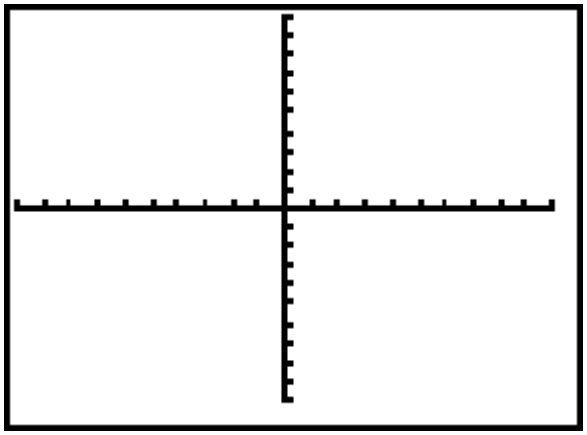
67. Use your graphing calculator to graph both of these equations on the same axes:

$$y = x^2 + 1$$
$$y = x + 3$$

Sketch a graph of what you see on your graphing calculator.

Use your graphing calculator to find the coordinates of the intersection of the graphs.

answer: _____



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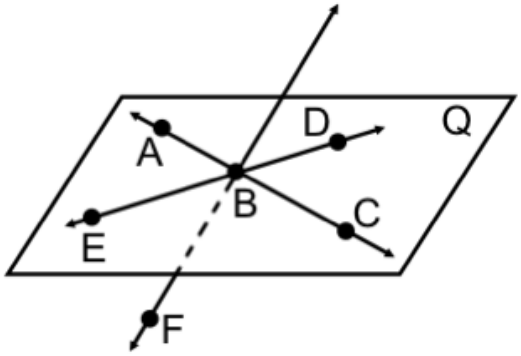
Geometry Reference Sheet

Point: A location

Ex: Point B

- Two segments meet at a point.
- Two lines intersect at a point.



Line: A series of points that extends in opposite direction without end.

Ex: $\overleftrightarrow{BF}$

- Two points define a line.

Plane: A flat surface that extends in all directions.

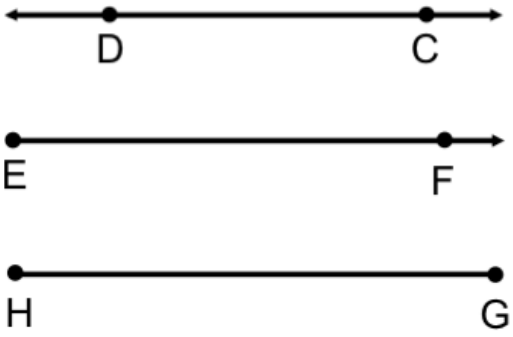
Ex: Plane ABD or Plane ABCD or Plane Q

- If more than one plane is visible, use 3 letters to define a plane.
- A plane and a line intersect at a point.

Line: A series of points that extends in opposite direction without end.

Ex: $\overleftrightarrow{DC}$

- A line is defined by two points.



Ray: A ray is part of a line consisting of one endpoint and all the points of the line on one side of the endpoint.

Ex: $\overrightarrow{EF}$

- A ray is defined by an endpoint and another point on the line. (The endpoint comes first in the notation.)

Segment: Part of a line consisting of two endpoints.

Ex: $\overline{HG}$

- A segment is defined by its endpoints.

Plane: A flat surface, like the side of a box

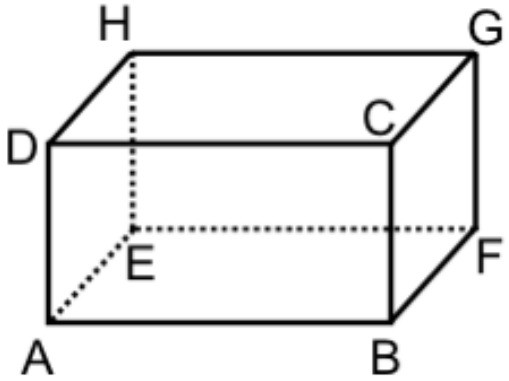
Ex: Plane ABF or Plane ABEF

- If more than one plane is visible, use 3 letters to define a plane.
- Two planes and a line intersect at a line or segment

Face: A side in a 3-D figure.

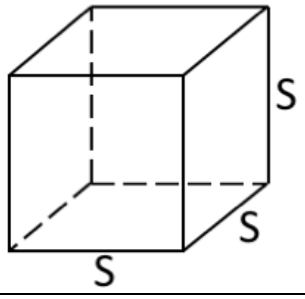
Edge: A segment where two faces (sides) meet.

Vertex: Where three or more faces meet. (a corner)

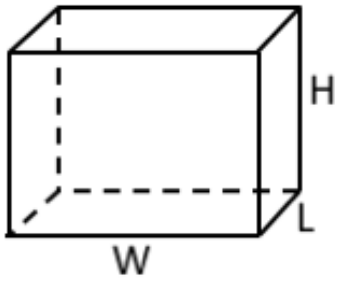


Solids and Their Measures

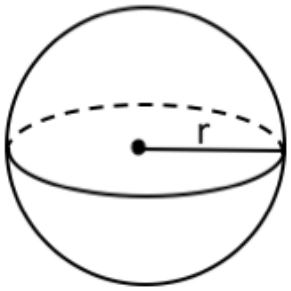
CUBE



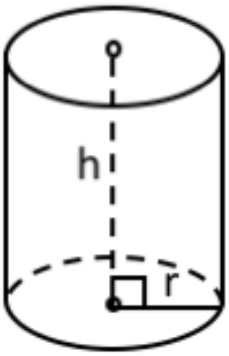
RIGHT RECTANGULAR PRISM



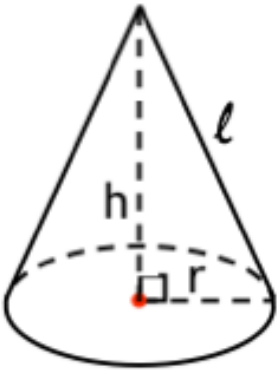
SPHERE



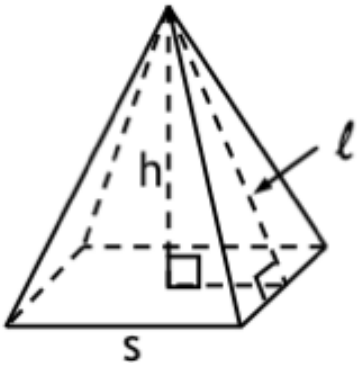
RIGHT CIRCULAR CYLINDER



RIGHT CIRCULAR CONE



RIGHT SQUARE PYRAMID



Formulas

AREA FORMULAS

square ..... $A = s^2$

rectangle ..... $A = bh$

parallelogram ..... $A = bh$

triangle ..... $A = \frac{1}{2}bh$

trapezoid ..... $A = \frac{1}{2}h(b_1 + b_2)$

circle ..... $A = \pi r^2$

VOLUME FORMULAS

cube ..... $V = s^3$
(s = length of an edge)

right rectangular prism ..... $V = lwh$

OR

$V = Bh$
(B = area of a base)

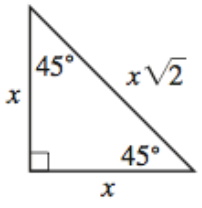
sphere ..... $V = \frac{4}{3}\pi r^3$

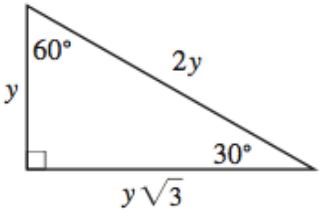
right circular cylinder ..... $V = \pi r^2 h$

right circular cone ..... $V = \frac{1}{3}\pi r^2 h$

right square pyramid ..... $V = \frac{1}{3}s^2 h$

SPECIAL RIGHT TRIANGLES





CIRCLE FORMULAS

$C = 2\pi r$

$A = \pi r^2$