Summer Math Packet

Students entering Geometry

Name:_____ Date:_____

Teacher:_____ School: Union High School

Formula Chart

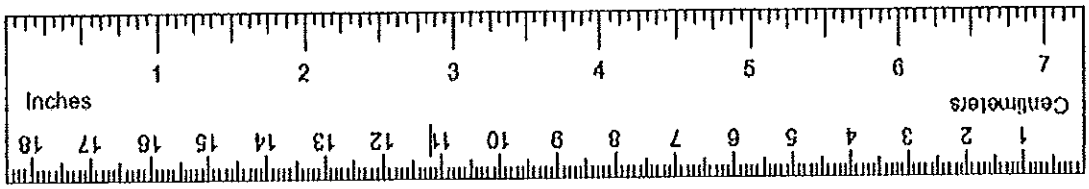
π equals approximately 3.14

Circumference	circle	$C = 2\pi r$
Area	triangle	$A = \frac{1}{2}bh$
	trapezoid	$A = \frac{1}{2}(b_1 + b_2)h$
	circle	$A = \pi r^2$
Surface Area	right cylinder	$S = 2\pi rh + 2\pi r^2$
	sphere	$S = 4\pi r^2$
Volume	rectangular prism	$V = lwh$
	cylinder	$V = \pi r^2 h$
	cone	$V = \frac{1}{3}\pi r^2 h$
	sphere	$V = \frac{4}{3}\pi r^3$
Pythagorean Theorem	right triangle	$a^2 + b^2 = c^2$

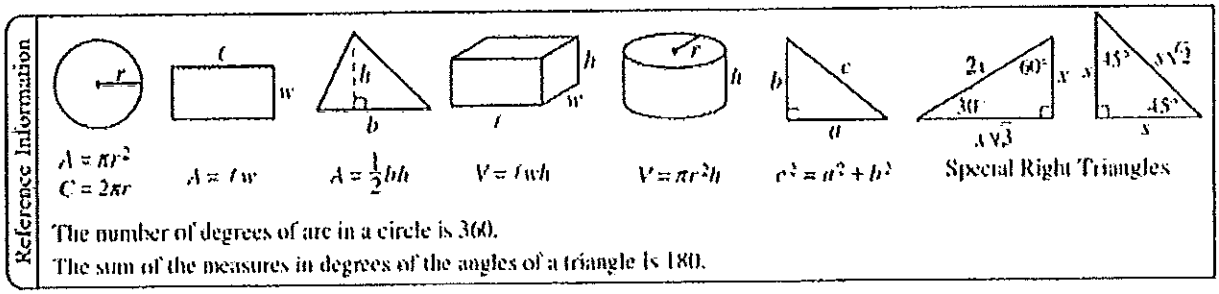
Measurement Conversions

	Metric	Customary
Length	1 kilometer = 1,000 meters 1 meter = 100 centimeters 1 centimeter = 10 millimeters	1 mile = 5,280 feet
Volume	1 liter = 1,000 milliliters	1 gallon = 4 quarts 1 quart = 2 pints 1 pint = 2 cups 1 cup = 8 ounces
Weight and Mass	1 kilogram = 1,000 grams 1 gram = 1,000 milligrams	1 ton = 2,000 pounds 1 pound = 16 ounces
Time	1 year = 365 days 1 year = 52 weeks	

Ruler



SAT Formula Sheet



Other Useful Formulas

The following formulas are not included on the CAPT formula chart. However, these formulas can be useful in solving some of the contextual problems found on the CAPT in a more efficient manner.

Have students solve problems using a variety of strategies including using specific formulas.

Slope-Intercept Form:

$y = mx + b$

where m = slope and b = y-intercept

Point-Slope Form:

$y - y_1 = m(x - x_1)$

where m = slope and (x_1, y_1) is a point on a line

Slope:

$m = \frac{(y_2 - y_1)}{(x_2 - x_1)}$ where (x_1, y_1) and (x_2, y_2) are two points on a line.

Temperature Formulas:

$°C = \frac{5}{9}(F - 32)$

$°F = \frac{9}{5}C + 32$

Polygon Angle Formulas:

Sum of the measures of the interior angles of a polygon with n sides is $(n-2)(180°)$.

The measure of an interior angle of a regular n-sided polygon is $\frac{(n-2)(180°)}{n}$.

Distance Formula:

$d = rt$

where d = distance, r = rate, and t = time

Exponential Growth:

$y = a(1+r)^t$ where a is the initial amount, r is the growth rate and y is the amount after t time periods

Probability:

Theoretical Probability $P(\text{event}) = \frac{\textit{Number of Favorable Outcomes}}{\textit{Total Number of Outcomes}}$

Experimental Probability $P(\text{event}) = \frac{\textit{Number of Successes}}{\textit{Number of Trials}}$

General Formulas for Surface Area (SA) and Volume (V):

General Prisms

$V = Bh$

SA = *sum of the areas of the faces*

Part I: Short Response

Algebra Skill Review

1. Evaluate when a = 2 and b = -5

   a. $b^3 - a^3$

   b. $a - b^2$

2. Evaluate when r = 3 and q = -2

   a. $rq + q^2$

   b. $3rq^3 + r^2q$

3. Solve the following equation for x.

   a. $2 + 5x = 57$

   b. $3x - 5 = 4x - 2(4 - x)$

   c. $3 - 2(x - 1) = 2 + 4x$

   d. $\frac{10}{x} = \frac{16}{96}$

   e. $\frac{x+1}{7} = \frac{5}{x-1}$

4. Write both solutions for x.

   a. $x^2 = 169$

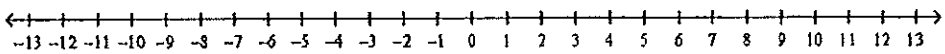
   b. $x^2 - 6 = 30$

5. Factor

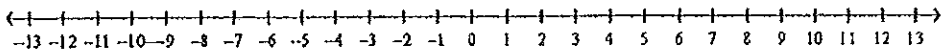
   a. $x^2 - 144$ b. $x^2 + 8x + 16$ c. $x^2 - 2x - 35$

6. Solve and graph the inequalities.

   a. $x \leq -3$



   b. $3x + 6 \geq -12$



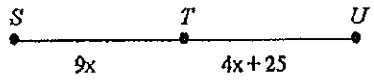
7. Rearrange each formula to find the underlined variable.

   a. $V = \underline{l}wh$

   b. $P = 2\underline{L} + 2w$

   c. $N = g\underline{h} + j\underline{h}$

8. If T is the midpoint of $\overline{SU}$, find the values of x and ST. The diagram is not to scale.



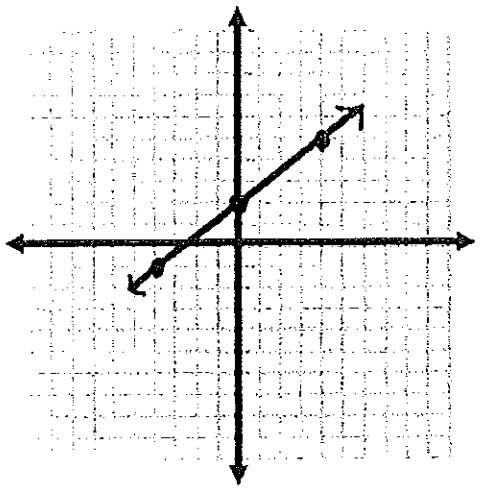
9. According to the pattern, make a conjecture about the product of 13 and 8,888,888.

$$13 \cdot 88 = 1144$$
$$13 \cdot 888 = 11{,}544$$
$$13 \cdot 8888 = 115{,}544$$
$$13 \cdot 88{,}888 = 1{,}155{,}544$$

10. Find the slope of the line between these two points.(-3,4) (5,6)

11. Find the x-intercept and y- intercepts in the graph of $3x + 4y = 48$

12. Use the graph to find the following:



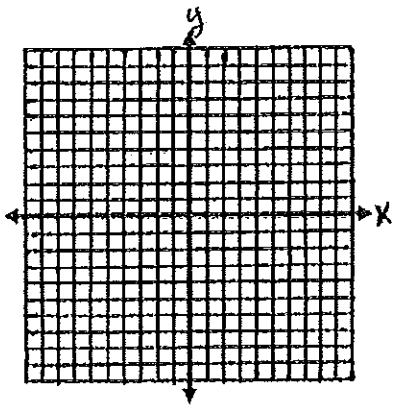
a. Slope

b. y-intercept

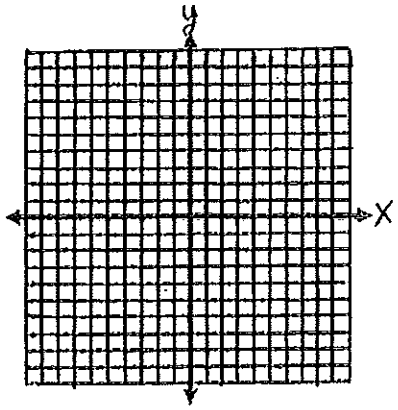
c. Equation of the line in slope, intercept form

13. Write the equation of each line in slope-intercept form. Graph the line below:

a. $2y = -6x + 8$



b. $3x - y = 7$



14. Write the equation of the line that passes through (5,-8) and is parallel to $y = 9x + 4$

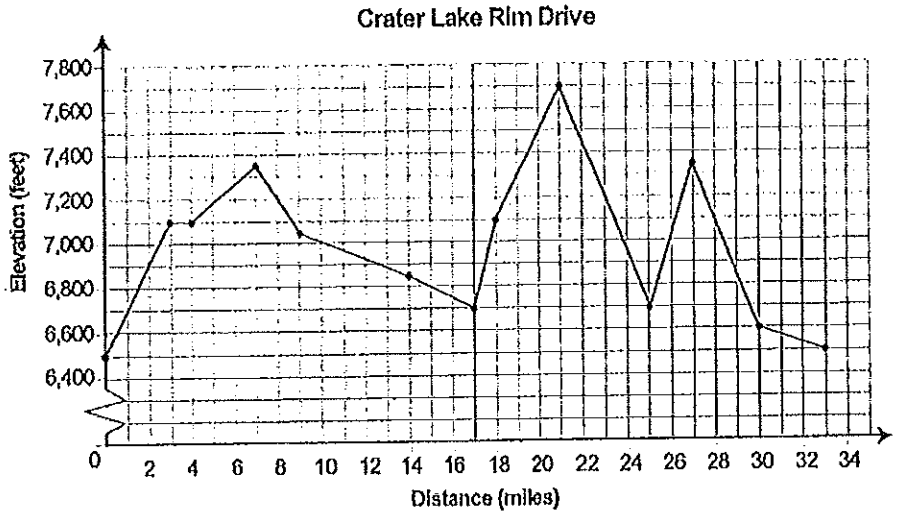
Leave in slope-intercept form.

15. Write the equation of the line that passes through (-7,2) and is perpendicular to $8 + 7x = y$

16. Write the equation of the line that passes through (5,-3) and (4,-2) in both slope-intercept and point-slope form.

17. CAPT Mathematics: *Crater Lake*
Algebraic Reasoning

Crater Lake's 33-mile Rim Drive is popular with cyclists. The graph below shows the elevation change between key points of interest along Rim Drive.



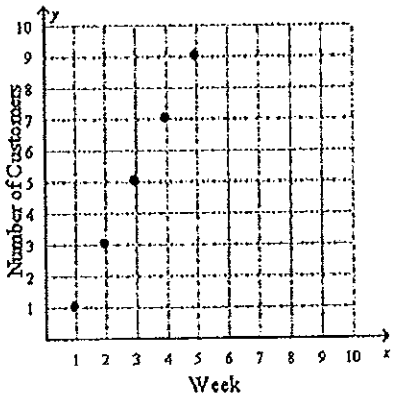
Show or explain how, according to the graph, how many miles of Rim Drive are downhill?

18. May's Internet Services designs websites. May noticed an increase in her customers over a period of 5 consecutive weeks.

a. Based on the pattern shown in the graph, make a conjecture about the number of customers May will have in the 8th and 10th weeks.

b. Find the slope for the graph.

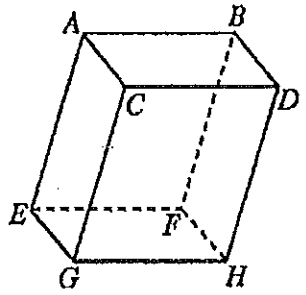
c. Write the equation of the line in $y = mx + b$ form.



Part II: Extended response and Grid In

Geometry

19. Use the prism to find the following line segments.

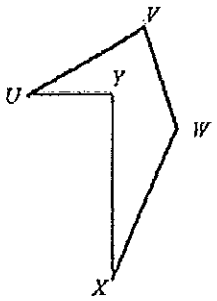


a. Name 2 lines parallel to $\overline{CD}$.

b. Name 2 lines perpendicular to $\overline{CD}$.

c. Name 2 lines skew to $\overline{CD}$.

20. Judging by appearance, name and give the characteristics of an acute angle, an obtuse angle, and a right angle.



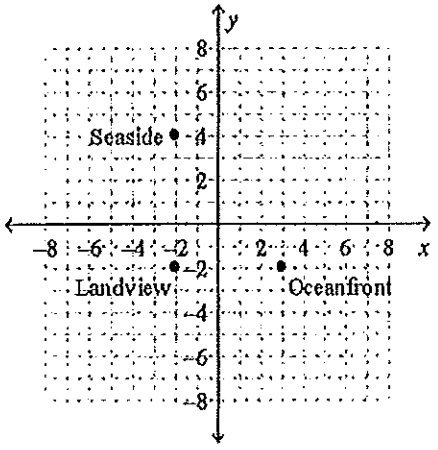
21. Using the map below and given that each unit on the map represents 5 miles:

a. What is the actual distance from Oceanfront to Seaside?

b. What is the actual distance from Landview to Seaside?

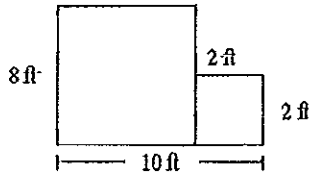
c. What is the actual distance from Oceanfront to Landview?

d. Find the area of land within these three landmarks.

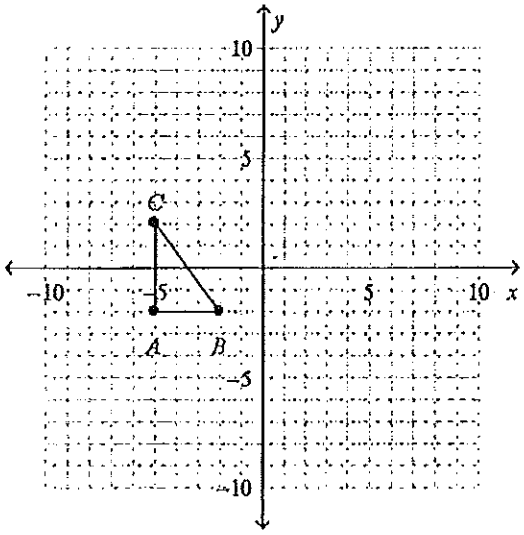


22. The figure is formed from rectangles. Find the total area and perimeter of the figure.

The diagram is not to scale.



23. Find the perimeter of ΔABC with vertices $A(-5, -2)$, $B(-2, -2)$, and $C(-5, 2)$.



24. Use the figure below to find the following values.

a. Write an expression that gives the area of the *shaded* region in the figure below.

b. Find the perimeter of the shaded area.

c. Find the area of the non-shaded area.

The diagram is not to scale.