

## **Summer Packet for Students Entering 11th Grade Applications and Interpretations SL**

### **Directions:**

1. Please complete all questions in the work space provided or on a separate sheet of paper that is clearly and neatly numbered.
2. You must show all of your work for each question. If you are stuck, please use the resource links provided in the section.
3. Your teacher will check this assignment on the FIRST day of school at the beginning of class. This will be your first completion grade so make sure you have attempted each problem.
4. If there are questions that you had a difficult time with, please list them in the box below (or highlight them on a separate sheet of paper). We expect you to use the resources provided if you are stuck, but understand there may be additional support needed for some questions.

### **Assessment:**

1. On the second day of math, you will have a summative quiz based on the skills on this summer packet.
2. You will get 5 points for bringing your TI-84 CE Plus to class with you on the day of the test. This is a required tool that you will use throughout high school.

### **Extra Support:**

1. The math department will have extra help days for the summer packet close to the return of school. Please check the school's website during the summer for the dates.
2. On the first day back to school, we will dedicate time in class to go over the answers and for you to ask your teacher questions.

## Summer Review for students entering Math Application and Interpretations in 11th grade

Please complete the following problems before the first day of class. Show all needed work.

Topic 1: Rounding, decimal approximations and significant figures,  
*links for review: [rules for significant figures on Khan Academy](#), [Scientific notation on Khan Academy](#)*

1. Write the following numbers:

- a. Write 16 billion in numbers
- b. Write 16 billion as a power of 10
- c. The speed of light is 0.0024567 meters per sec. Write in scientific notation.
- d. Write 120 million as a number and in scientific notation
- e. The speed of sound is 0.0000357 meters per sec. Write in scientific notation

2. Round the measurements to 3 significant figures

- a. 12.31 cm
- b.  $-0.8055$  m
- c. 40112 km
- d. 17.332 m.

3. State the number of significant figures in each of the following.

- a. 1.00067
- b.  $-2.3401$
- c. 0.0003
- d. 1400

4. Write the following quantities using scientific notation. Round your answer to 3 significant digits
- a. 5,345,000 m
  - b. The solar radius is approximately 695,700,000,000 cm
  - c. The Earth radius is 640.1 million centimeters
  - d. There are 412,252,003,274,489,856,000 possible permutations of the Rubik's cube

## Topic 2: Simplifying Expressions

links for review: [Factoring examples from Khan Academy](#), [Rearranging formulas on Khan Academy](#), [simplifying negative exponents on Khan Academy](#), [Simplifying roots from Khan Academy](#)

5. Simplify the following using the order of operations:
- a. Find the value of  $3x - 6y - z$  if  $x = -1$ ,  $y = -2$ ,  $z = 5$
  - b. Simplify  $7(9) - 72 - 3(5)^2$

c. Simplify  $10 - 3 + \frac{2}{5}(-3)$

d. Simplify  $\frac{3}{4} - 2(\frac{-1}{5}) + 7.6$

6. Simplify the following using factoring or distributive property.

a. Factor  $x^2 + 8x + 12$

b. Factor:  $k^2 - 9k + 14$

c. Factor  $144 - w^2$

d. Factor:  $x^3 + 3 + 2x$

e. Multiply and simplify :  $(3n + 1)(4n + 1) + (n + 2)(4n + 1)$

7. Simplify the following exponential expressions with positive and negative exponents.

a.  $(9x^4y^3)(-2x^7y^2)$

b.  $6\left(\frac{v^2}{3x^3}\right)^3$

c.  $\left(\frac{18p^4}{3p^{-3}}\right)^{-2}$

8. Simplify the radical expressions. Write your answer in simplest radical form.

a.  $\sqrt{60}$

b.  $\sqrt{540}$

c.  $\sqrt[3]{3000}$

d.  $2\sqrt{12} + 3\sqrt{45} + 3\sqrt{3}$

e.  $5(-4\sqrt{6} + \sqrt{10})$

f.  $\sqrt{2} + 3\sqrt{8} - 4\sqrt{2}$

### Topic 3: Solving Equations

links for review: [Rearranging formulas on Khan Academy](#), [Simplifying quadratics from Khan Academy](#)

9. Rearrange the following equations to solve for the indicated variable.

a. Solve for  $t$ :  $A = p + prt$

b. Solve for  $c$ :  $S = 2ab + 2bc + 2ac$

10. Solve each of the linear or quadratic equations for  $x$

a.  $2(x + 3) - 6x + 4 = -2(4 - x)$       b.  $\frac{x}{3} + 5 = -13$

c.  $x^2 + 7x = -10$

d.  $3x^2 - 5x - 2 = 0$

#### Topic 4: Graphing

11. Find the intersection points of the given functions  $f(x) = x - 1$ ,  $g(x) = 2x$

12. Consider the graph  $y = 0.4x^2 - 2x - 8$

a. Find the coordinates where the graph crosses the  $x$  - axis

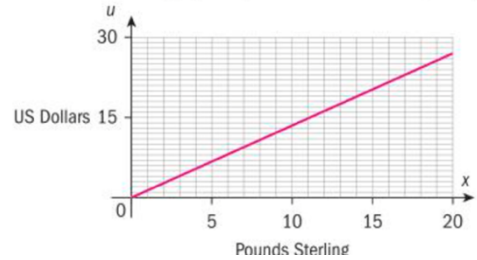
b. Find the coordinates of the  $y$  - intercept

c. Find the equation of the axis of symmetry.

13. Use the graph to answer the following:

- a. Write down a coordinate of a point on the graph that gives you some accurate information about the relationship.

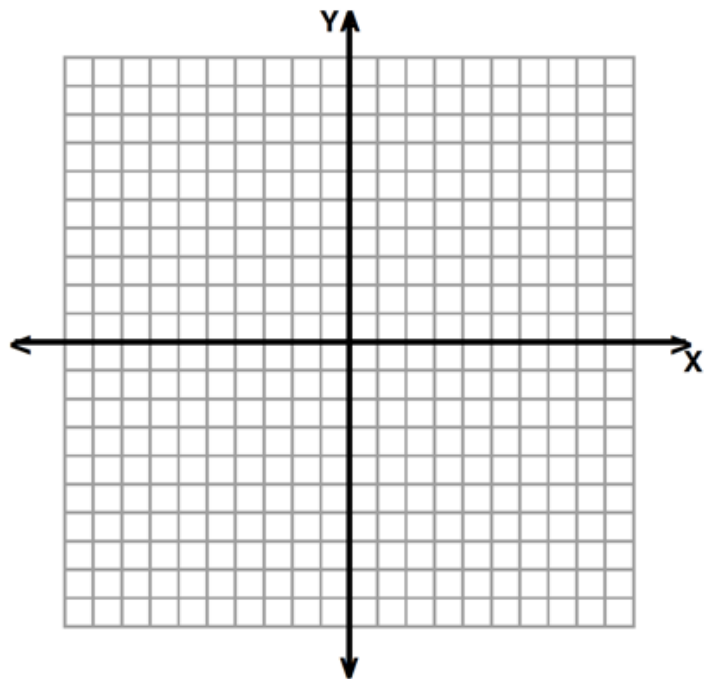
The graph shows the equivalence between Pounds Sterling (UK£) and US Dollars (US\$).



- b. Find the slope of the line

- c. Find a formula  $u(x)$ , where  $u(x)$  is the number of US dollars \$, and  $x$  is the number of UK pounds £

14. Graph the function  $f(x) = -1 - 3x$

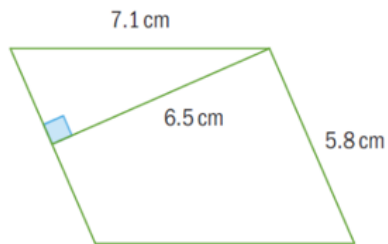


## Topic 4: Geometry

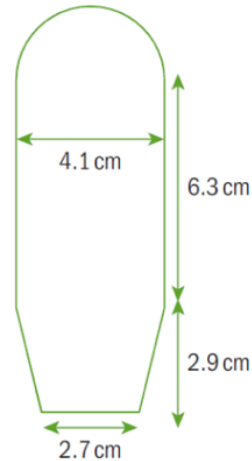
links for review: [Perimeter and Area of plane figures on Khan Academy](#), [Volumes from Khan Academy](#)

15. Find the perimeter and the area:

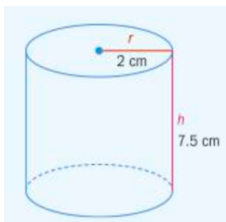
a.



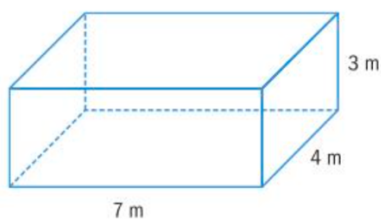
b.



16. Calculate the volume of the cylinder with radius of 2 cm and height of 7.5 cm



17. A swimming pool with the dimensions shown is filled with water. The cost of water is \$1.50 per cubic meter of water. Find the cost of filling the pool.





18. A silo has cylindrical part and roof that is a hemisphere. The radius of the cylinder is 3 m and its height is 12m.

a. Find the volume of the silo.

b. The entire silo is to be painted. Find out how much paint is needed if one liter of paint covers  $8.5 \text{ m}^2$  of surface.

#### Topic 4: Statistics and Probability

links for review: [Measures of center from Khan Academy](#), [Probability from Khan Academy](#),

19. Given the data: 12 15 8 16 24 5 13 2 34 21 18 15 12 8 4

a. Find the measures of center (mean, median, mode)

b. Find the measures of spread (range,  $Q_1$ ,  $Q_3$ , interquartile range)

20. The table show the number of zoo visits per year made by families.

a. Find the mode, median and mean.

Number of visits	0	4	6	8	10	12	14
Frequency	3	2	8	4	2	12	5

b. Find the range and interquartile range.

21. The number of tomatoes in 9 baskets is: 24 21 23 24 21 20 22 21 22

- a. Find the mean and standard deviation.
- b. 10th basket of tomatoes is included and the new mean is 22.2
- c. Find the number of tomatoes in the 10th basket.

22. Calculating probabilities of simple events

- a. A 12-sided die with sides numbered 1 through 12 is rolled. Assuming that all sides are equally likely to be rolled, what is the probability that the number rolled is a multiple of 3? Give your answer as a fraction in lowest terms.
- b. One card is drawn at random from a deck of cards. What is the probability that the card will be a red ace?
- c. Suppose that a town named Sunnyvale had 217 sunny days in 1998. What is the empirical probability that it will be sunny in Sunnyvale on a random day?

Reflection

23. Which topics of this review do you understand completely?

24. Which topics of this review do you need additional practice?