Algebra 2 Summer Math Assignment **Name:**

I. For each multiple-choice question, circle the correct answer. Show your work or thought process in the box on the right.

1. A drawer contains 4 red pens, 5 blue pens, and 2 black pens. If you reach into the drawer without looking and you pull out a pen for you and a pen for your friend, what is the probability that the first pen will be blue and the second pen will be black? A. 2/121 B. 11/40 C. 1/3 D. 1/11	WORK:
2. Which of the following situations represents events that are independent? (That is, the outcome of the first event has no effect on the outcome of the second event.) A. two marbles are selected from a container without replacement. B. Two children born in a family are a boy and a girl. C. A ticket is selected for second prize after the first-prize ticket has been selected. D. a king is selected from a deck of cards after two kings have already been dealt.	WORK:
3. Light travels at a speed of about 186,281.7 miles per second. How far would light travel in 365 days? A. 5.87×10^{12} miles B. 6.79×10^{7} miles C. 7.05×10^{13} miles D. 9.7×10^{13} miles	WORK:

4. Mrs. Brokes had twice as many ten-dollar bills as five-dollar bills. She had $675 in all. Which of the following equations CANNOT be used to figure out how many of each bill she had? A. $5x + 10(2x) = 675$ B. $25x = 675$ C. $x + 2x = 675$ D. $5x + 20x = 675$	WORK:
5. Which decimal would represent an irrational number? A. 0.201201201201201… B. 0.42200112200112200 11… C. 0.201220011222000111.. D. 0.222000111222000111…	WORK:
6. A true/false quiz has 10 questions. How many different sets of answers are possible? A. 10! B. 20 C. 2^{10} D. 100	
7. Each employee of ABC Spy Agency must have a seven-digit identification number. For security purposes, authentic identification numbers have the following feature: *The product of the sum of the first four digits and the sum of the last three digits must equal 432.* Based on this system, which of the following could be an authentic identification number? A. 6594783 B. 7865916 C. 4341331 D. 5378924	

II. Constructed Response Questions. Show all work and clearly indicate your final answer for each question.

8. Spike has applied for a job as a florist. He had to choose between two salary options. Plan 1: $800 a month + 6 % of monthly sales or Plan 2: 10% of monthly sales. Sales for the prior months were:

   - January - $9,000
   - February - $15,000
   - March - $6,000
   - April - $12,000

Based on this information, which salary option should Spike select if he decides to accept this job? Explain your answer.

9. A student had the following grades in her math class tests:

   100, 98, 96, 45, 89, 91, 89

   - Which of the above grades is the outlier? Why?
   - Which is the mean of the test scores?
   - Which is the mode of the test scores?
   - If the students wants an 88 average, what does she need to earn on the next test?

10. Mark Smith has $1,000 that he is saving for his college education. He has decided to invest this money in an investment that will return 5% each year.

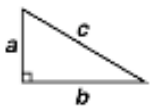
If all earnings are reinvested and Mark makes no withdrawals, the total amount of money Mark would have after each year of the investment can be thought of as a sequence A0, A1, A2, …An, where A0 represents his initial investment of $1000, and An represents the amount of money he would have after n years of investment.

- Determine the value of A1 and A2. Show your work.
- Approximately how many years will it take Mark to double his initial investment at the 5% rate of return? Show your work.

HIGH SCHOOL PROFICIENCY ASSESSMENT
MATHEMATICS REFERENCE SHEET

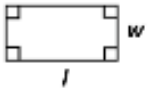
Pythagorean Formula

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



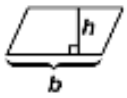
Rectangle

Area = lw
Perimeter = $2(l + w)$



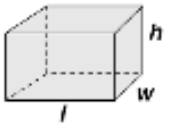
Parallelogram

Area = bh



Rectangular Prism

Volume = lwh
Surface Area = $2lw + 2wh + 2lh$



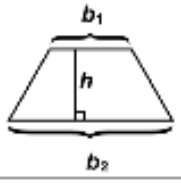
Sphere

Volume = $\frac{4}{3}\pi r^3$

Surface Area = $4\pi r^2$

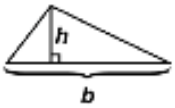
Trapezoid

Area = $\frac{1}{2}h(b_1 + b_2)$



Triangle

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



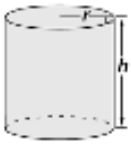
Circle

Area = πr^2
Circumference = $2\pi r$

Cylinder

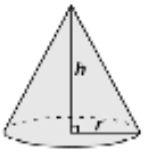
Volume = $\pi r^2 h$

Surface Area = $2\pi rh + 2\pi r^2$



Cone

Volume = $\frac{1}{3}\pi r^2 h$



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

12 inches = 1 foot
3 feet = 1 yard
36 inches = 1 yard
5,280 feet = 1 mile
1,760 yards = 1 mile

100 centimeters = 1 meter
1000 meters = 1 kilometer

8 fluid ounces = 1 cup
2 cups = 1 pint
2 pints = 1 quart
4 quarts = 1 gallon

1000 milliliters (mL) = 1 liter (L)

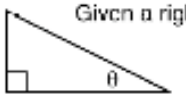
16 ounces = 1 pound

1000 milligrams = 1 gram
100 centigrams = 1 gram
10 grams = 1 dekagram
1000 grams = 1 kilogram

The sum of the measures of the interior angles of a triangle = 180°
The measure of a circle is 360° or 2π radians

$\pi \approx 3.14$ or $\frac{22}{7}$

Given a right triangle:



$\sin\theta = \frac{\text{opposite side}}{\text{hypotenuse}}$ $\cos\theta = \frac{\text{adjacent side}}{\text{hypotenuse}}$ $\tan\theta = \frac{\text{opposite side}}{\text{adjacent side}}$

Interest = principal × rate × time

Simple Interest Formula: $A = p + prt$ **Compound Interest Formula:** $A = p\left(1+\frac{r}{n}\right)^{nt}$

A = amount after t years; p = principal; r = annual interest rate; t = number of years; n = number of times compounded per year

The number of **combinations** of n elements taken r at a time is given by $\frac{n!}{(n-r)!r!}$

The number of **permutations** of n elements taken r at a time is given by $\frac{n!}{(n-r)!}$

Given the points (x_1, y_1), (x_2, y_2),

Distance between two points:

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

Slope Formula:

$m = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$

Slope-intercept form of a line:

$y = mx + b$

Distance = rate × time