Roman Catholic High School
Summer Science/Math Assignment
9th Grade (Class of 2025)

Dear Parents/Guardians,

In a couple of months, your sons will be starting their high school careers at Roman Catholic High School. Incoming freshmen will be rostered for either the math-based science course, Physics First or Biology. In order to facilitate their transition to high school, **_all_** incoming freshmen will be required to complete a Math Readiness Summer Packet for their science course.

The attached packet is for students to complete over the summer and bring with them on the first day of class to be assessed accordingly. The packet is to help reinforce the material and help the teachers of the science courses to gauge their students' math ability as it relates to the science curriculum. Students are to try their best and to note which material they are having difficulty with as well as material they have never been exposed to in grade school.

Instructions for Assignment:

- All work is to be completed on loose leaf.
- Final answers for each calculation problem should be boxed.
- Graphing problems must be completed on graph paper.
- Since each lesson in the course contains some kind of mathematical reference, this packet will be referred to during the entire school year. We advise all students to secure this packet.
- This packet is due to your son's Science Teacher by **Monday, September 27th.**

Each section of the packet is clearly headed, followed by instructions, and a Khan Academy video explaining how to solve each problem or expression. For further clarification, you can create a Khan Academy account at www.khanacademy.org/math to view endless math equations, problems, and expressions. Additionally, to facilitate your son's ability to use the links, we have included a digital copy of this document on our website. Please visit www.romancatholichs.com and Summer Assignments can be found under the "Academics" tab.

If you have any questions concerning this assignment, please do not hesitate to reach me at vtarducci@romancatholichs.com or our Assistant Principal for Academic Affairs, Mr. Buck at cbuck@romancatholichs.com.

Best wishes for an enjoyable summer!

Mr. Vince Tarducci
Principal

Freshman Science Summer Packet

Basic Multiplying & Dividing. Evaluate.

1. $(-2)(-4) =$

2.) $15 \div 3 =$

3.) $8(-1) =$

4.) $(-21) \div (-7) =$

5.) $26(-12) =$

6.) $(-300) \div 6 =$

7.) $(-73)1 =$

8.) $(-72) \div (-9) =$

9.) $7(3) =$

10.) $0 \div (-20) =$

Percents. Read the word problem then solve to find the correct percentage.

11.) Dean ordered a set of beads. He received 70 beads, and 10% of them were orange. How many orange beads did Dean receive?

12.) The art club had an election to select a president. 9 out of the 12 members of the art club voted in the election. What percentage of the members voted?

13.) A school assembly had 30 students in attendance, and 20% of them were first-graders. How many first-graders were at the assembly?

14.) Brenda's Diner sold 10 milkshakes last week. 40% of the milkshakes had whipped cream on top. How many milkshakes with whipped cream were sold?

15.) At the sewing store, Ava bought a bag of mixed buttons. She got 21 buttons in all. 21 of the buttons were large. What percentage of the buttons were large?

16.) Ben earns $12,800 a year. About 15% is taken out for taxes. How much is taken out for taxes?

17.) What percentage of 80 is 50?

18.) 20 is what percentage of 25?

19.) What is 60% of 0?

20.) Find 10% of the number 50.

Integers. Evaluate each expression.

21.) $6 + (-12) + (-2) =$ 22.) $3 - (-13) =$ 23.) _____ $* (-8) = 32$

24.) $(-190) \div 2 =$ 25.) $(-10) \div$ ___ $= 5$ 26.) $(-16) - (-27) =$

27.) ___ $* (-9) = (-54)$ 28.) $(-60) \div (-12) =$ 29.) $8 + 15 + 14 =$

30.) $(-5) - 8 =$ 31.) $(-5) * 5 =$ 32.) $(-4) * (-9) =$

Exponents. Evaluate each expression- **Show all work**

33.) $10^3 =$ 34.) $10^{-3} =$ 35.) $(1/2)^5 =$ 36.) $10^9 =$ 37.) $1^0 =$

Write the following expressions using exponents.
38.) $45 * 45 * 45 * 45 =$

39.) $(-0.7) * (-0.7) * (-0.7) * (-0.7) * (-0.7) * (-0.7) * (-0.7) * (-0.7) =$

Evaluate.
40.) $10^4 + 0^{12} =$ 41.) $2^6 \div 4^2 =$

42.) $0^7 - 1^{15} =$ 43.) $9^3 \div 18 =$

Measurement Conversions. Convert.- **Show all work**

44.) 37 cm = _____ mm   45.) 20 m = _____ cm   46.) 34 m = _____ mm

47.) 20 m = _____ km   48.) 29 km = _____ m   49.) 36 km = _____ cm

50.) 100 g = _____ kg   51.) 24 kg = _____ g   52.) 8.3 g = _____ kg

Metric System. Answer each.

53.) The metric unit of measurement for mass is _____.

54.) The metric unit of measurement for weight is _____.

55.) The decimal equivalent for a meter is _____.

56.) The decimal equivalent for a centimeter is _____.

57.) When you move the decimal point two places to the left to convert a metric unit, it is the same as _____ the measurement by 100.

58.) When you move the decimal point two places to the right to convert a metric unit, it is the same as _____ the measurement by 100.

Scientific Notation. Convert the following numbers into scientific notation.

59.) $3,400 =$ _____   60.) $0.000023 =$ _____   61.) $4.50 =$ _____

62.) $1,000,000 =$ _____   63.) $0.00671 =$ _____

Convert the following numbers into standard notation.

64.) $2.30 * 10^4 =$ _____   65.) $1.76 * 10^3 =$ _____   66.) $1.901 * 10^{-7} =$ _____

67.) $1.76 * 10^0 =$ _____   68.) $5.40 * 10^1 =$ _____

Fractions (adding and subtracting, multiplying and dividing). Evaluate each.

69.) $6/12 + 2/10 =$ 70.) $4/8 + 3/4 =$ 71.) $1/2 * 2/5 =$ 72.) $1¼ * 3⅝ =$

73.) $1/4 ÷ 9/10 =$ 74.) $8/10 ÷ 2/5 =$ 75.) $12/25 - 11/25 =$ 76.) $1⅜ - ⅞ =$

Order of Operations. Evaluate each.

Remember, PEMDAS (Please Excuse My Dear Aunt Sally) stands for: Parentheses Exponents Multiplication Division Addition Subtraction

www.khanacademy.org/math/pre-algebra/pre-algebra-arith-prop/pre-algebra-order-of-operations/v/more-complicated-order-of-operations-example

77.) $14 + 18 \div 2 * 18 =$

78.) $15 * 18 + 12 \div 3 + 9 =$

79.) $(11 + 42 - 5) \div (11 - 4) =$

80.) $(10 + 59 - 3^2) \div (24 - 4) =$

Students- Please watch the Screencastify link provided below. This video will help guide you on the topic of graphing. The video will provide you with the information for setting up, creating and understanding the parts of a graph.

https://drive.google.com/file/d/1tuoMZUTv5tV5-TQrdeGJhQFsccO8Ohdi/view

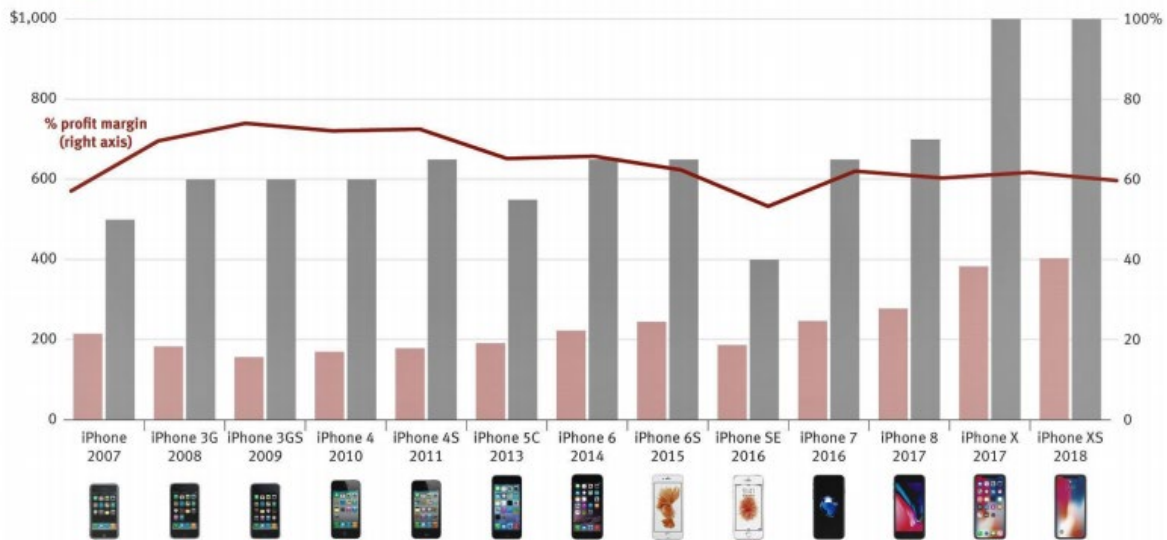# Graphical Analysis of Scientific Data

Graphing Data and Analysis Questions for Graph of the Week

Using the attached graph/data complete the following questions

Questions.

1. What is the title of the Graph? _____

2. What scales are used on the graph?_____
   Why?_____

3. What units are being utilized in the graph?_____
   Why? _____

4. What quantities are being compared?_____

5. Are there x and y axises?_____
   If so, What does the x-axis represent?_____

What does the y-axis represent?_____

How does that relate to the independent and dependent Variables?

_____

6. What type of graph is this?_____

Why was this type chosen? _____

7. Is there an upward or downward trend?_____

Are there any sudden spikes in the graph?_____

If so, what accounts for them?_____

If not why would they not be there? _____

8. What do you foresee happening in the future?_____

What prediction can you make for the future? _____

_____

9. What inferences can you make about the graphs? _____

_____

10. What are the limitations of the graphs? _____

_____

11. Is this data accurate?_____

Do we believe this information is true?_____

Why or Why not? _____

12. Is this data meaningful? _____

Do we believe this information is important?_____

Why or Why not?_____

13. What choices did the person who created these graphs make?

_____

Why did they make those choices? _____

_____

14. For each graph: Identify any changes, trends or differences you see in the graph
or figure. _____

_____

Write 3 "What I see" comments based on what you have identified.
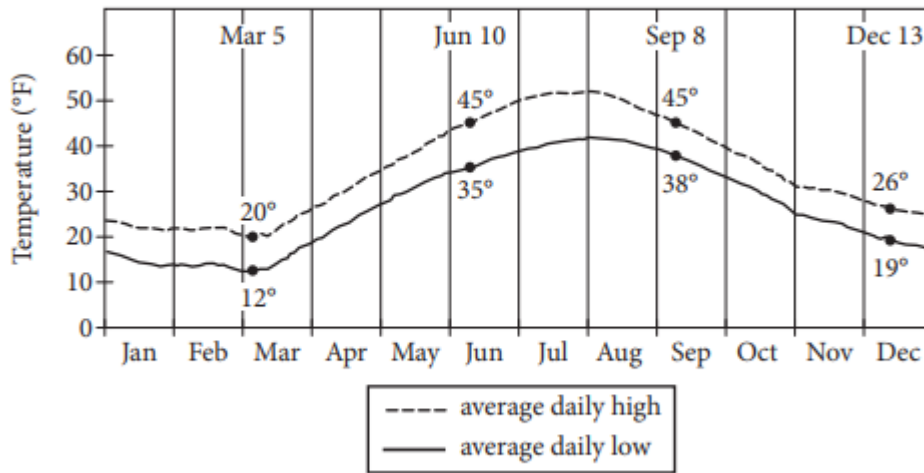
1) _____

2) _____

3)_____

For each "What I see" comment written, interpret the meaning by writing a "what it
means" comment. _____

_____

_____

15. How are the two graphs related?_____

_____

What information do they provide together that individually they do
not?_____

Average Daily High and Low Temperatures Recorded at Nuuk Weather Station, Greenland (1961—1990)

Adapted from WMO. ©2014 by World Meteorological Organization.

Which choice most accurately represents the information in the graph?

a. The difference between the average daily high and the average daily low is constant throughout the year

b. The difference between the average daily high and the average daily low is greatest on June 10

c. The difference between the average daily high and the average daily low is lowest on March 5

d. The difference between the average daily high and the average daily low is the same on both June 10 and Sep 8

The loss of ice **_due to melting of the ice sheet_** would be expected to be least on

a. March 5

b. Jun 10

c. Sep 8

d. Dec 13

Reading Passage: Tsunami speed as a function of ocean depth.

A tsunami is a very long-wavelength wave of water that is generated by sudden displacement of the seafloor or disruption of any body of standing water. Tsunami are sometimes called "seismic sea waves", although they can be generated by mechanisms other than earthquakes. Tsunami have also been called "tidal waves", but this term should not be used because they are not in any way related to the tides of the Earth. Because tsunami occur suddenly, often without warning, they are extremely dangerous to coastal communities.

Wave velocity is the speed of the wave. Velocities of normal ocean waves are about 90 km/hr while tsunami have velocities up to 950 km/hr (about as fast as jet airplanes), and thus move much more rapidly across ocean basins

The table below shows depth and velocity data for a tsunami. From this information:

1. Define dependent variable _____

_____

2. Define independent variable _____

_____

3. Identify the dependent variable. _____

4. Identify the independent variable _____

5. On graph paper, create a velocity-depth graph from the information in the data table.

6. State the type of graph that is characteristic of velocity with depth?
_____

Data:

Depth (meters)	Velocity (km/h)	Wavelength (km)
7000	943	282
4000	713	213
2000	504	151
200	159	48
50	79	23
10	36	10.6

7. Predict the tsunami speed for the following ocean depths:

a. 8000 meters _____
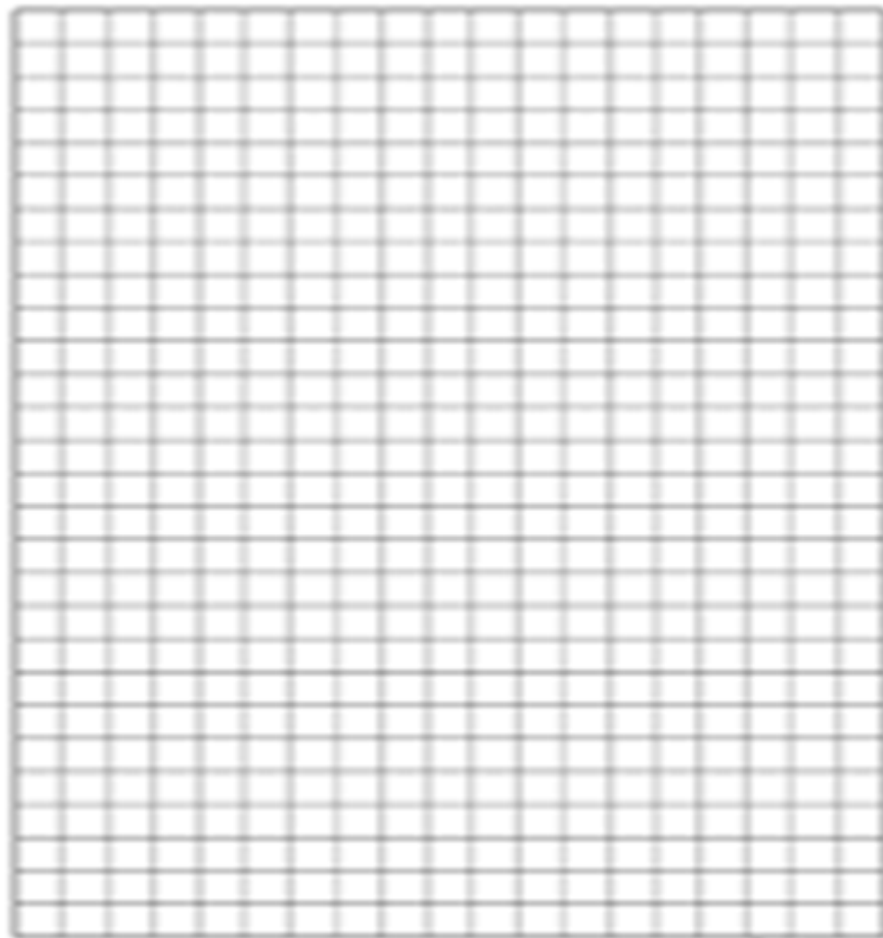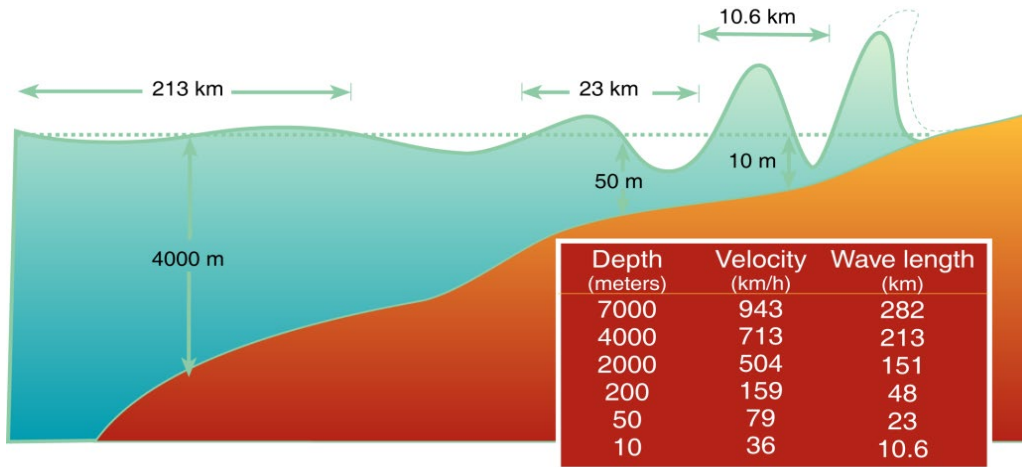
b. 3500 meters _____

c. 70 meters _____

d. 5 meters _____

The diagram below includes the wavelength of a tsunami.

8. On graph paper, create a graph of the wavelength with ocean depth.

9. What type of graph is characteristic of wavelength with depth? _____

Depth (meters)	Velocity (km/h)	Wave length (km)
7000	943	282
4000	713	213
2000	504	151
200	159	48
50	79	23
10	36	10.6

Factoring and Distributing. Simplify by factoring or distributing.
www.khanacademy.org/math/pre-algebra/pre-algebra-equations-expressions

81.) $2(x + 3) =$ 82.) $2(x + 3 + y) =$ 83.) $-5(2x - 3) =$

84.) $-5(-8w + p) =$ 85.) $20 + 32w =$ 86.) $84 + 36z =$

87.) $(2x - 6)(5x + 7) =$ 88.) $(y - 10)(4y + 2) =$

Solving One Step Equations. Solve each word problem.
A linear equation is of the form y=mx+b
Use the distance formula to solve questions 89-92; d = vt, where d is the distance traveled, v is the velocity and t is the time.
www.khanacademy.org/math/algebra/one-variable-linear-equations/alg1-one-step-add-sub-equations/v/adding-and-subtracting-the-same-thing-from-both-sides

89.) A car travels at 40 km/hr for 2 hours and at 55 km/hr for 2 hours. How far has the car traveled? What is its average velocity?

90.) How long will it take an airplane to travel 1,250 kilometers if it is traveling at 150 km/hr?

91.) A car is traveling at 5 m/s. How far has it gone in 12 seconds?

92.) A train travels 600 kilometers in 1 hour. What is the train's velocity in meters/second?

93.) There were 32 students in Jaden's class eating lunch. Then, more students joined Jaden's class. Now there are 86 total students eating lunch. How many students joined Jaden's class?

94.) Kari, Katelynn, and Morgan went out for dinner and split the bill evenly. The total bill was $46.68. How much did each pay?