Warm Up

A social networking site currently has 70,000 active members. If the sites loses 5% of its active members each month, how many active members can the site expect to have in 2 months?

Rate: -5% Factor: 0.95

$$y = 70{,}000(0.95)^2$$
$$= 63{,}175$$

Mult

Homework Questions?

WHEN IN DOUBT, EXPAND IT OUT!

Simplify.

3. $(-5x^2y)(3x^4)$

$-15x^6y$

4. $(2ab^2c^2)(4a^3b^2c^2)$

$8a^4b^4c^4$

5. $(3cd^4)(-2c^2)$

$-6c^3d^4$

6. $(4g^3h)(-2g^5)$

$-8g^8h$

7. $(-15xy^4)\left(-\frac{1}{3}xy^3\right)$

$5x^2y^7$

8. $(-xy)^3(xz)$

$-x^3y^3 \cdot xz$

$-x^4y^3z$

9. $(-18m^2n)^2\left(-\frac{1}{6}mn^2\right)$

$(-18)^2m^4n^2 \cdot -\frac{1}{6}mn^2$

$54m^5n^4$

10. $(0.2a^2b^3)^2$

$0.04a^4b^6$

11. $\left(\frac{2}{3}p\right)^2$

$\frac{4}{9}p^2$

12. $\left(\frac{1}{4}cd^3\right)^2$

$\frac{c^2d^6}{16}$

13. $(0.4k^3)^3$

$0.064k^9$

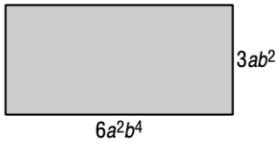
14. $[(4^2)^2]^2$

$4^8 = 65536$

Using the MCAS Reference Sheet, find the areas and volumes of the following figures. **Always write the formula you will be using first before substituting in values.** Use 3.14 for the value of π.

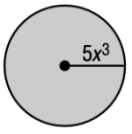
GEOMETRY Express the area of each figure as a monomial.

15.



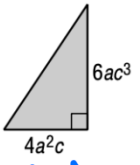
$A = L \cdot w$
$= 6a^2b^4 \cdot 3ab^2$
$= 18a^3b^6$

16.



$A = \pi r^2$
$= \pi (5x^3)^2$
$= \pi (25x^6)$
$= 78.5x^6$

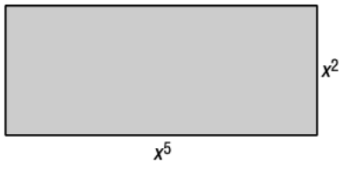
17.



$A = \frac{1}{2} b \cdot h$
$= \frac{1}{2} \cdot 4a^2c \cdot 6ac^3$
$= 12a^3c^4$

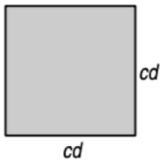
GEOMETRY Express the area of each figure as a monomial.

25.



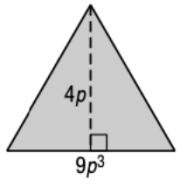
$A = L \cdot w$
$= x^5 \cdot x^2$
$= x^7$

26.



$A = s^2$
$= (cd)^2$
$= c^2d^2$

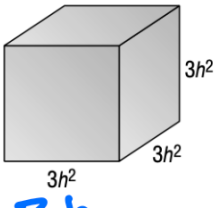
27.



$A = \frac{1}{2} b \cdot h$
$= \frac{1}{2} \cdot 4p \cdot 9p^3$
$= 18p^4$

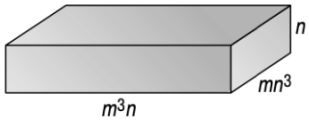
GEOMETRY Express the volume of each solid as a monomial.

18.



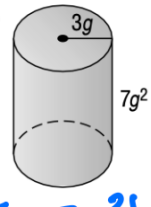
$V = B \cdot h$
$= L \cdot w \cdot h$
$= 3h^2 \cdot 3h^2 \cdot 3h^2$
$= 27h^6$

19.



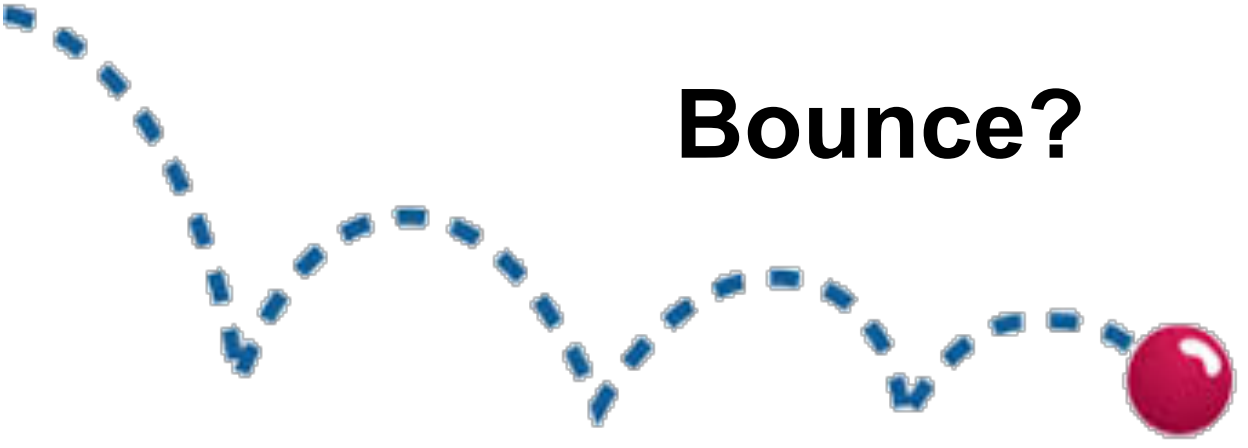
$V = L \cdot w \cdot h$
$= m^3n \cdot mn^3 \cdot n$
$= m^4n^5$

20.



$V = \pi r^2 h$
$= \pi (3g)^2 \cdot 7g^2$
$= \pi (9g^2) \cdot 7g^2$
$= 197.82g^4$

How High Will It Bounce?



What kind of ball do you think is the "bounciest"?

Lacrosse, Tennis, Ping Pong, Golf, Basketball or Playground Ball

Name: _____ Team Members: _____

How High Will It Bounce?

Many games depend on how a ball bounces. For example, if all basketballs did not rebounded the same a player would be unable to anticipate how their shot would bounce off the backboard which may cause them to miss their shot. There are actually industry standards for ball bounciness!

What kind of ball do you think is the "Bounciest"? Predict the order from least bouncy to greatest.

Lacrosse ball, Tennis ball, Basketball, Ping Pong Ball, Golf Ball, Playground Ball

Least ⟷ greatest

Put your bounciness predictions along the number line.

Part 1 – Determining Rebound Heights

You are going to determine the rebound height for the ball you have been assigned. To do this you will be dropping the ball from various heights and recording the maximum height it attains after bouncing once on the floor. To help determine the rebound height, you will want to video the rebound of the ball.

Team Jobs:

Dropper - _____

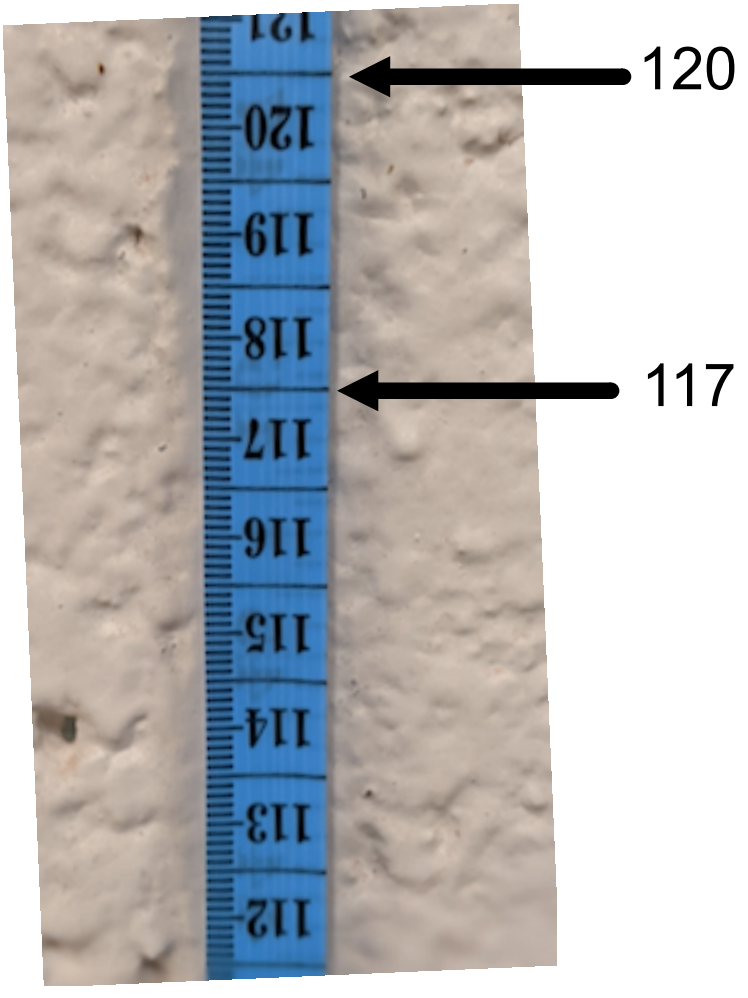
Videographer - _____

Spotter/Recorder(s) - _____

Guidelines:

- Pick five different drop heights you wish to test.
- When taking the video of each rebound, make sure the iPad is perpendicular to the floor and parallel to the wall that the measuring tape is on.
- Ball height measurements will be made from the _____ of the ball.

A note about using the measuring tapes.
They are upside-down!

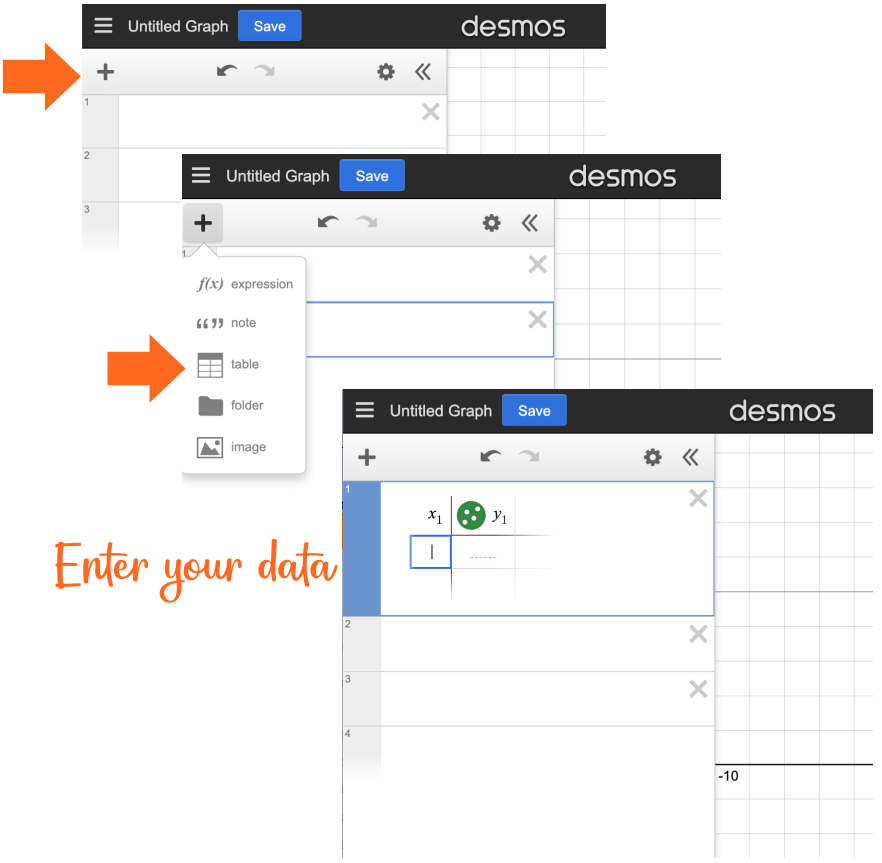


What are your general observations? Is there anything interesting or surprising?

1. What is the independent variable and what is the dependent variable?

2. Calculate Rebound Ratios by dividing *Rebound Height* by *Drop Height*. Determine a Rebound Ratio that feels like a good representative for your data set. Show the work below.

Inserting a table in Desmos:



3. Using Desmos, add a table and plot your points. Looking at your graph, would a linear model or exponential model represent the situation best?

4. If you think it is linear you can have Desmos calculate a line of best fit.
   In a new line, type $y_1 \sim mx_1 + b$. Look at the calculated values of *m* and *b* and write a linear equation.

   $y =$ _____

5. What does your slope mean in the context of the situation?

6. Is your y-intercept realistic? Justify your answer in the context of the situation.

7. Compare the *Rebound Ratio* from Question 2 and the *slope* of your line of best fit. What do you notice?

8. If you dropped your ball from a height of 25 feet, what would be the rebound height? **Use your equation to prove your answer.**

Homework

Finish sheet