Geometry Summer Assignment Name_____

DUE: August 9, 2022

This assignment is for students who have completed Algebra I or Algebra I Honors and are taking Geometry in the 2022-2023 school year.

Did you read the instructions? _____

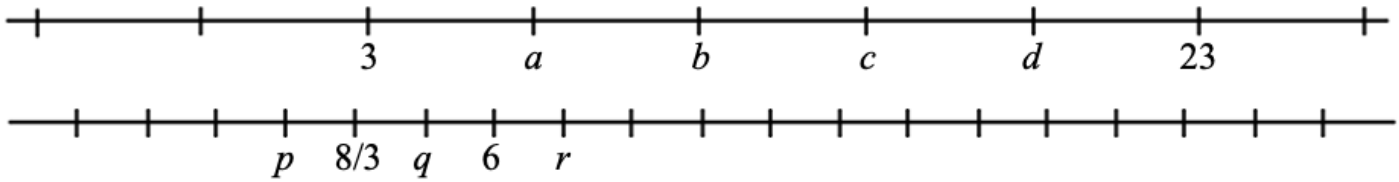
What math are you taking in the 2022-2023 school year? _____

The expectation of the Math Department at Archbishop Hannan High School is that its students become Tenacious Problem Solvers! Thus, as you work on these problems be sure and document your strategies, your mathematical explanations, any drawings, tables or graphs that you use, and the best, complete answer you can find. We hope that you are challenged by these problems and enjoy them. We look forward to the discussion of these problems that we will have in the first weeks of school. Come prepared to defend your solution!

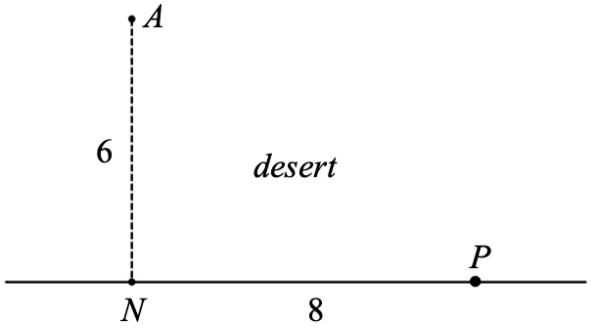
1. Without resorting to decimals, find equivalences amongst the following nine expressions:

$\frac{2 \cdot 3}{5}$ $\left(\frac{3}{5}\right) \cdot 2$ $3 \cdot \left(\frac{2}{5}\right)$ $\left(\frac{2}{5}\right)\left(\frac{3}{3}\right)$ $\left(\frac{5}{3}\right)2$ $2 \div \frac{5}{3}$ $\frac{2}{5}$ $\frac{5}{3} \div \frac{1}{2}$ $\frac{3}{5/2}$

2. On each of the following number lines, all of the labeled points are evenly spaced. Find *coordinates* for the seven points designated by the letters:



3. Alex the geologist is in the desert, 6 miles from a long straight road. On the road, Alex's jeep can do 50 mph, but in the desert sands, it can only go 30 mph. Alex is very thirsty and wants to buy a Pepsi at a gas station which is 8 miles down the road from the nearest point, N, on the road. Which route would take Alex less time: going directly from A to P, or traveling from A to N to P?



4. A team has started its season badly, winning 1 game, losing 6 and tying none. The team will plan a total of 25 games this season. Round all answers to the nearest percent.

a) What percentage of the seven games played so far have been wins?

b) Starting with its current record of 1 win and 6 losses, what will the cumulative winning percentage be if the team wins the next 4 games in a row?

c) Starting with its current record of 1 win and 6 losses, how many games in a row must the team win in order for its cumulative winning percentage to reach at least 60%?

d) Suppose that the team wins ten of its remaining 18 games. What is its final winning percentage?

e) How many of the remaining18 games does the team need to win so that its final winning percentage is at least 60%? Is it possible for the team to have a final winning percentage of 80%? Explain.

5. Chris does a lot of babysitting. When parents drop off their children and Chris can supervise at home, the hourly rate is $3. If Chris has to travel to the child's home, there is a fixed charge of $5 for transportation in addition to the $3 hourly rate.

a) Graph $y = 3x$ and $y = 3x + 5$ on a coordinate grid. (You will have to do this on some graph paper and include the graph when you hand your work. Be sure to label your graph!) What do these two lines have to do with the babysitting context? What feature do they have in common? How do they differ?

b) What does the graph of $y = 3x + 6$ look like? What change in the babysitting context does this line suggest?

c) What does the graph of $y = 10x + 5$ look like? What change in the babysitting context does this line suggest?

Geometry Essential Skills

ID: 1

The following problems represent the essential skills you need to be successful in Geometry.

Solve each equation.

1) $-33 + 8n = 1 + 6(1 + 3n)$

2) $3x + 2 = x - 2$

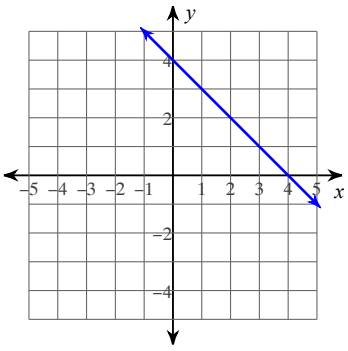
Solve each proportion.

3) $\frac{a}{7} = \frac{a+1}{6}$

4) $\frac{k+8}{5} = \frac{k-4}{2}$

Write the slope-intercept form of the equation of each line.

5)



Write the slope-intercept form of the equation of the line through the given points.

6) through: $(5, 0)$ and $(0, -1)$

Write the slope-intercept form of the equation of the line described.

7) through: $(-4, -4)$, parallel to $y = 2x + 1$

8) through: $(4, -2)$, perp. to $y = 2x - 5$

Solve each system by substitution.

9) $y = -7x + 22$
$y = -5x + 14$

10) $-7x + 2y = -8$
$y = x - 4$

Solve each system by elimination.

11) $7x + 5y = -22$
$x - 5y = 14$

12) $7x + 5y = 6$
$7x + 5y = 14$

Simplify. Your answer should contain only positive exponents.

13) $3x^2y^2 \cdot 4y^{-4}$

14) $(ab^0)^0 \cdot (2a^4b^{-4})^3 \cdot a^2b^3$

Simplify each sum.

15) $(-6 - 6x - 5x^2) + (-x^3 + 7x + 4)$

Simplify each difference.

16) $(2n^2 - 3n + 6n^4) - (-7n^4 - 7n^2 + 7n)$

Find each product.

17) $(m + 2)(5m - 2)$

18) $(2n - 1)^2$

Factor the common factor out of each expression.

19) $7x + 28x^3$

20) $15x^3y^4z^3 + 40x^4y^3$

Factor each completely.

21) $56r^3 - 224r^2 + 32r - 128$

22) $7n^3 + 21n^2 - 8n - 24$

23) $p^2 + 4p - 12$

24) $5n^2 + 33n + 18$

Solve each equation by taking square roots.

25) $81x^2 - 7 = 74$

26) $2p^2 - 4 = 14$

Solve each equation by factoring.

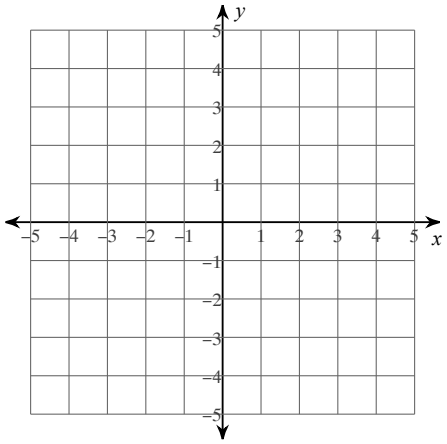
27) $8a^2 + 8a - 4 = -4$

28) $3k^2 + 4k - 32 = 0$

Solve each system by graphing.

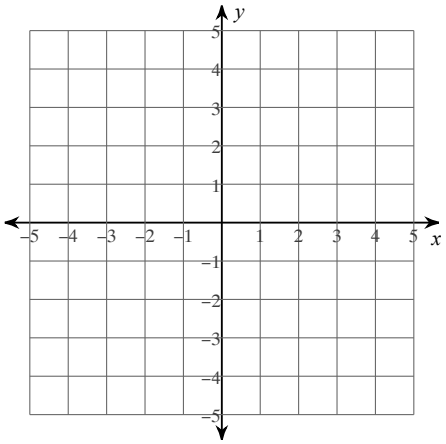
29) $y = \frac{1}{2}x + 4$

$y = -\frac{7}{2}x - 4$



30) $8x + y = 4$

$x + y = -3$



Simplify.

31) $\sqrt{100}$

32) $\sqrt{392x^2}$