

DUE: August 8, 2022

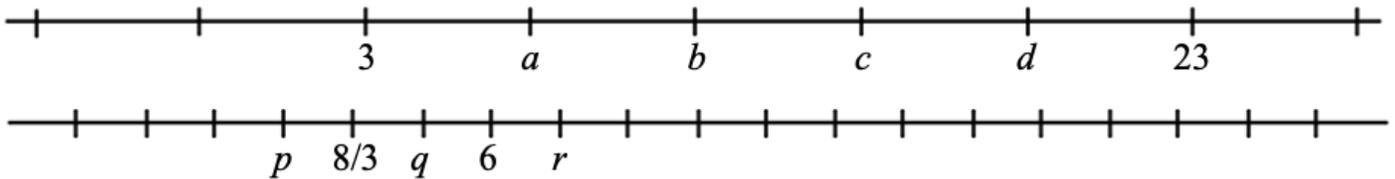
This assignment is for students who have completed Algebra I or Algebra I Honors and are taking Geometry Honors in the 2022-2023 school year.

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. 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:



2. Often it is necessary to rearrange an equation so that one variable is expressed in terms of others. For example, the equation $D = 3t$ expresses D in terms of t . To express t in terms of D , divide both sides of this equation by 3 to obtain $\frac{D}{3} = t$.

a) Solve the equation $C = 2\pi r$ for r in terms of C .

b) Solve the equation $p = 2w + 2h$ for w in terms of p and h .

c) Solve the equation $3x - 2y = 6$ for y in terms of x .

3. 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?

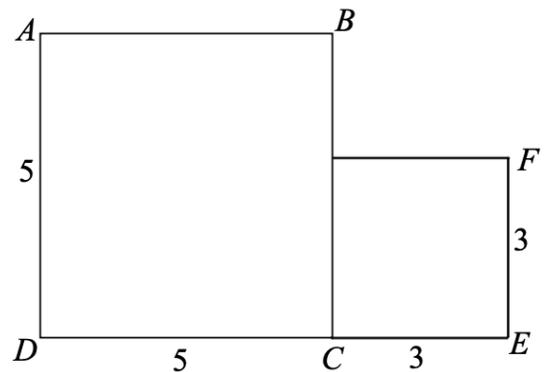
c) Starting with its current record of 1 win and 6 losses, how many games in a row must the team win in order for its cumulative winning percentage to reach at least 60%?

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

e) How many of the remaining 18 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

4. A 5 X 5 square and a 3 X 3 square can be cut into pieces that will fit together to form a third square.

a) Find the length of a side of the third square.



b) On a piece of graph paper (I recommend cm graph paper you can print from the internet), draw the above diagram of 2 squares. Mark point P on segment DC so that $PD = 3$. Using a ruler, draw segments PA and PF . Calculate the lengths of those segments.

c) Segments PA and PF divide the squares into pieces. Cut the pieces and arrange them to form the third square. Tape it to your work once you have figured out the puzzle.

Essential Skills

ID: 1

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

Solve each equation.

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

2) $-\frac{3}{2}x + 1 = -\frac{7}{2} + \frac{1}{2}x$

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 the line through the given points.

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

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

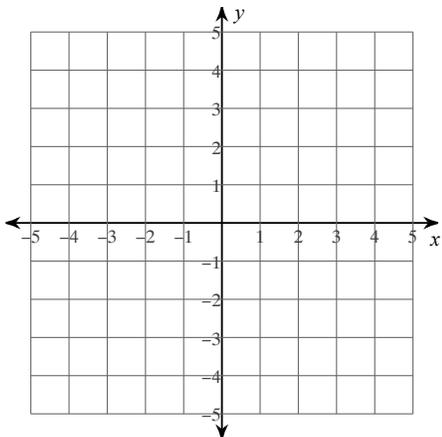
6) through: $(-4, -4)$, parallel to $y = 2x + 1$

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

Solve each system by graphing.

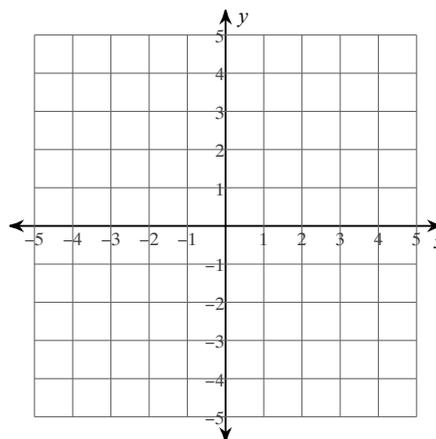
8) $y = \frac{3}{2}x - 2$

$y = \frac{1}{4}x + 3$



9) $-2y = -3x + 2$

$3x - 2y = -4$



Solve each system by substitution.

10) $y = -7x + 22$

$y = -5x + 14$

11) $y = 4x - 3$

$-8x + 2y = -6$

Solve each system by elimination.

12) $7x + 5y = -22$

$x - 5y = 14$

13) $-2x + 3y = 11$

$x + 3y = 26$

Simplify. Your answer should contain only positive exponents.

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

15) $x \cdot (x^{-1}y^{-1})^0$

16) $\left(\frac{u^0v^{-1}}{u^2v^{-3} \cdot 2u^{-3}v^4}\right)^2$

17) $\frac{2x^0y^2 \cdot 2y^3}{(2x^{-2})^2}$

Simplify each sum.

18) $(-6 - 6x - 5x^2) + (-x^3 + 7x + 4)$

Simplify each difference.

19) $(2n^2 - 3n + 6n^4) - (-7n^4 - 7n^2 + 7n)$

Find each product.

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

21) $(2n - 1)^2$

Factor the common factor out of each expression.

22) $7x + 28x^3$

23) $6m^5n^3 + 16m^6n^5 + 6m^5n^2$

Factor each completely.

24) $n^2 - 5n - 36$

25) $2v^2 + 20v$

26) $n^2 - 100$

27) $3b^2 - 19b - 40$

Solve each equation by taking square roots. Round to the nearest tenth when necessary.

28) $9k^2 + 10 = 775$

29) $2p^2 - 4 = 14$

Solve each equation by factoring.

30) $8a^2 + 8a - 4 = -4$

31) $b^2 + 8b + 12 = 0$

Solve the equation with the quadratic formula. Round to the nearest tenth.

32) $10v^2 - 3v - 23 = 0$

Simplify by writing your answer in simplified radical form.

33) $\sqrt{100}$

34) $\sqrt{45}$

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

36) $\sqrt{128p^3}$

Find the distance between each pair of points. Give your answer in simplified radical form.

37) $(5, 4), (2, 0)$

38) $(-3, -5), (6, 8)$

Find the midpoint of the line segment with the given endpoints.

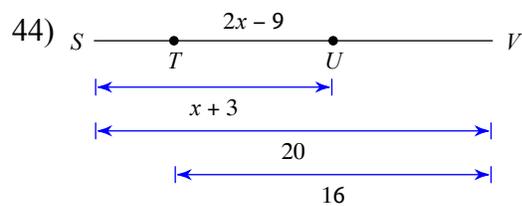
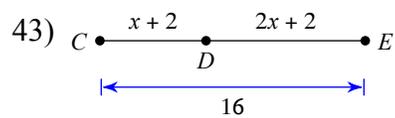
39) $(2, -8), (-6, 4)$

40) $(-3, 0), (-3, 1)$

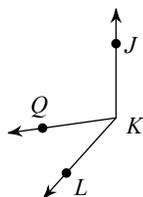
Given the midpoint and one endpoint of a line segment, find the other endpoint.

41) Endpoint: $(7, -2)$, midpoint: $(6, -10)$

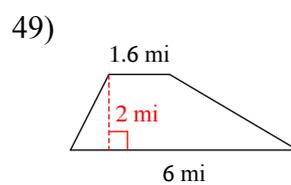
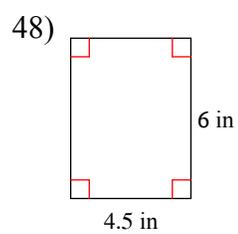
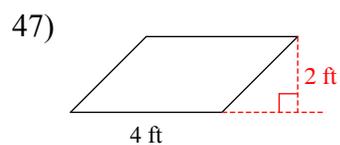
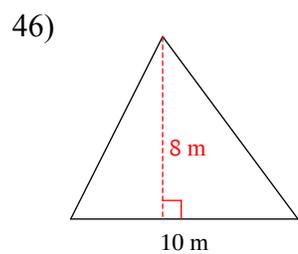
42) Endpoint: $(6, -5)$, midpoint: $(-2, -6)$

Solve for x .

- 45) Find x if $m\angle LKJ = 10x + 18$,
 $m\angle QKJ = 98^\circ$, and $m\angle LKQ = 3x + 4$.

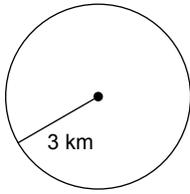


Find the area of each. Give a unit of measure



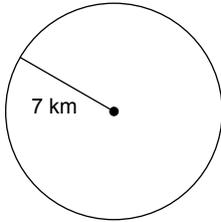
Find the circumference of each circle. Give your answer in terms of pi.

50)



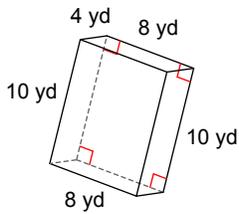
Find the area of each. Give your answer in terms of pi.

51)

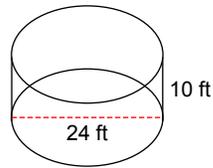


Find the surface area of each figure. Round your answers to the nearest hundredth, if necessary.

52)

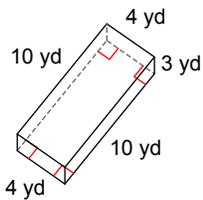


53)



Find the volume of each figure. Round your answers to the nearest hundredth, if necessary.

54)



55)

