| Match 2 Round 1 |
| Arithmetic: Factors |
| And Multiples |

1)_____

2.) _____

3.) _____

1.)_ How many natural numbers M where $1 \leq M \leq 100$ can be factored as p^2q where p and q are primes and $p \neq q$?

2.)_ N is a whole number $0 \leq N \leq 9$. For what values of N is the expression $2^N + 3$ <u>not</u> a prime number?

3.) A and B are positive integers. The greatest common factor of A and B is 30. The least common multiple of A and B is 27000. What is the smallest possible value of A+B ?

Match 2 Round 2
Algebra: Polynomials
And Factoring

1.)_____

2.) _____

3.) _____

1.)_ $(x+2)(3x+4)(5x+6)=ax^3 + bx^2 + cx + d.$ Find a+b+c+d.

2.) Factor completely over the integers: $(x+1)^4 +(x-1)^4$

3.) Express as the product of a trinomial and a binomial:
$4a^2 -9b^2 +6b-4a$

FAIRFIELD COUNTY MATH LEAGUE 2018-2019

Match 2 Round 3
Geometry:
Area and Perimeter

1._____ cm^2_

2. _____ cm^2

3._____ _____cm

1.)_ A right triangle has sides of length x cm, (x+7) cm, and (x+9) cm. Find the area of the triangle in cm^2.

2.)_ A circle is circumscribed about a regular hexagon which has perimeter $12\sqrt{3}$ cm. Find the area that is inside the circle but outside the hexagon.

3.)_ An isosceles trapezoid has area 30 cm^2. The height of the trapezoid is 6 cm and one base is 5 cm longer than the other base. Find the perimeter of the trapezoid.

Match 2 Round 4
Algebra 2: Inequalities
And Absolute value

1)_____

Remember to use AND or OR or
the shorthand notation for a conjunction
if you answer with <. >, ≤. or ≥ .   2.) _____
You may use union and intersection
symbols if you answer using interval
notation.

3.) _____

1.) Solve for x: $\dfrac{|3-5x|}{2}+7<13$

2.) Solve for x: $|5x-2| = |x-4| + 3$

3.) Solve for x: $\dfrac{3}{x+1}<1-\dfrac{2}{x-1}$

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Match 2 Round 5
Trigonometry:
Laws of Sine and Cosine

Note: Drawings not
necessarily drawn to scale. _
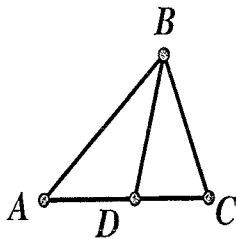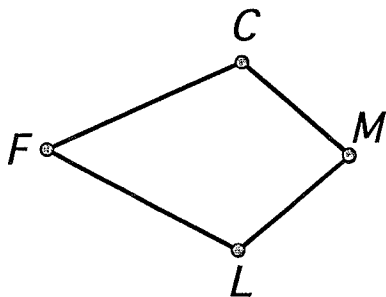
1.) _____

2.) _____

3.)_____

1.) In $\triangle XYZ$, ~~XZ=3~~, YZ=4,, $\angle X = 45°, \angle Y = 15°$. Find XY.

2.) $\overline{BD}$ bisects $\angle ABC$ in $\triangle ABC$. If AD=4 CD=6, and
$\angle BAD = 45°$, find the sine of $\angle BCD$

3.) In kite FCML, CM=ML, FC=FL, $\angle F = 30°$ and $\angle M = 150°$.
and CM=10. Find $(FC)^2$

1.) _____

2.) _____

3.) _____

1.) $\triangle ABC$ has vertices A(7,4), B(5,2), and C(-2,8).   Give the equation of the line that contains the median of the triangle from point A. Express your answer as y=mx+b

2.)_ Give the equation of the line tangent to the circle $(x-3)^2 + (y-4)^2 = 25$ at the point (6,8). Express your answer as y=mx+b

3.)_ A line intersects the parabola $x = y^2 - 4$ at the points (k+16, n) and (k, n-8). Find the equation of the line. Express your answer as y=mx+b.

1.) _____   4.) _____

2.) _____   5.) _____

3.) _____   6.) _____

1.) The greatest common factor of N and 702 is 78. The least common multiple of N and 1755 is 3510. Find all possible values of N.

2.) Factor as the product of a monomial, binomial, and trinomial with integer coefficients: $x^4 + 3x^3 + x^2 - 2x$

3.) Solve for all values of x: $2x^3 - 12x^2 - 8x + 53 < 5$

4.) Two adjacent sides of a rectangle have lengths |x+4| cm and |x-4| cm. The area of the rectangle is 9 cm². Find all possible values for x.

5.) In quadrilateral WXYZ, XY=8, YZ=9, ZW=12, $\angle Y = 60°$. The total area of the quadrilateral is $18\sqrt{3} + 4\sqrt{73}$. Diagonal $\overline{XZ}$ is drawn. Find $\sin(\angle XZW)$

X
8
W
Y
12
9
Z
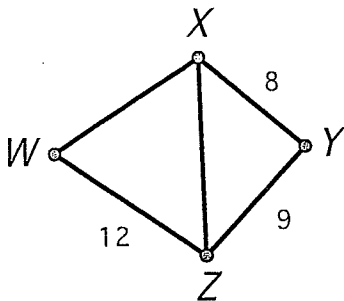
6.) In ΔABC, point A lies in the second quadrant and point C lies in the third quadrant. $\overline{AB}$ is contained in the line $3x + 4y = 10$ and $\overline{BC}$ is contained in the line $4x - 3y = 5$. $\overline{BC}$ has twice the length of $\overline{AB}$ and the area of ΔABC is 100. Find the equation of the line that contains $\overline{AC}$. Express your answer as y=mx+b.