Clyde Hill
ELEMENTARY PTA
www.ClydeHillPTA.org

Welcome to the March 2023 Clyde Hill Math Challenge Solutions!

We wish to thank everyone for participating! We had wonderful turnout - even more than last month! - and saw lots of effort and fun! Ya'll did great! Amazing showcase of our math muscles!

Thank you! Gracias! 谢谢！どうもありがとう! 감사합니다! धन्यवाद् ! спасибо! Благодаря!

Before going to this month's solutions, I wish to extend many thank yous to everyone who helped me get the Math Challenge off the ground and into as many languages as possible!

AJ Decostanza

Shera Myers

Principal García de León

Vice Principal Hook

Lizie Piazza

Charu Jeevanandam

Rajesh Sugumaran

Shoba Girish

Debyani Ghosh

Anu Bandi

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Yuji Ono

Junho Yamamoto

Joy Maeng

Jaehong Min

Karam Nam

Hyejin Cho

Suh Hyun Choi

Pavel Bronnikov

Thank you again everyone!

Jennie Cochran-Chinn and Clyde Hill PTA

Thank you! Gracias! 谢谢！どうもありがとう! 감사합니다! धन्यवाद् ! спасибо! Благодаря!

Name:_____
Grade: ____ Teacher:_____

Ten, diez, десять, 十, じゅう, 십, दस, عَشَرَةٌ

We are a multi language family at Clyde Hill. One way to share our languages with each other is to learn our numbers. Our first challenge is to finish the following math equations in various languages. There is a page in the back to help you! Then play the game! Cut out the flashcards on <https://www.clydehillpta.org/mathchallenge#march-2023-math-challenge> and quiz your friends. After every 5 rounds of flashcards, everyone does a round of compliments in any language!

one plus one equals __two__

1 + 5 = 6
uno más cinco son __seis__

3 + 5 = 8
три плюс пять равно __восемь__

5 + 4 = 9
五 加 四 等于 __九__

5 + 2 = 7
ご 足す に は __なな__

7 + 3 = 10
칠 더하기 삼 은 __십__

4 + 8 = 12
٤ + ٨ = __١٢__

13 = 7 + 6
__١٣__ = ٧ + ٦

five plus five equals __ten__

3 + 2 = 5
tres más dos es igual a __cinco__

9 + 0 = 9
девять плюс ноль равно __девять__

6 + 1 = 7
六 加 一 等于 __七__

3 + 6 = 9
さん 足す ろく は __きゅう__

5 + 4 = 9
오 더하기 사 는 __구__

2 + 3 = 5
٢ + ٣ = __٥__

5 = 1 + 4
__٥__ = ١ + ٤

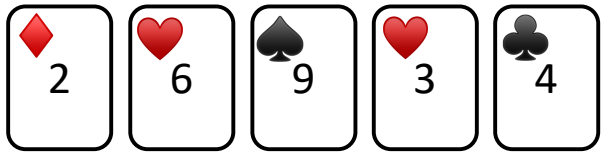
Name:_____

Grade: ____ Teacher:_____

Find 15

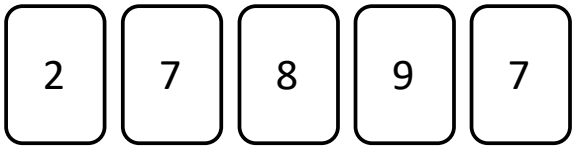
This game is about the various ways to make 15 with addition and subtraction. You can play this with a deck of cards. Use the Aces as 1s and remove the face cards so you are left with 1 through 10 in the 4 suits. To play, take turns between dealing 5 cards onto a surface and finding a way to add or subtract using ***exactly 3 cards from the 5*** dealt to make 15. The dealer double checks the finder's answer. Every 5 rounds players talk about how their day is going.

For example, if the 5 cards that are dealt are 2 diamonds, 6 hearts, 9 spades, 3 hearts, 4 clubs, then you can make 15 by adding the 2 diamonds, 4 clubs and 9 spades.

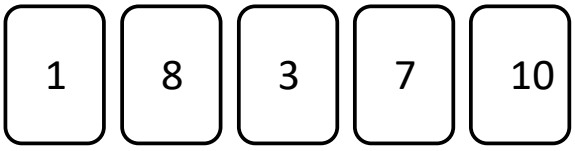


2+4+9=15

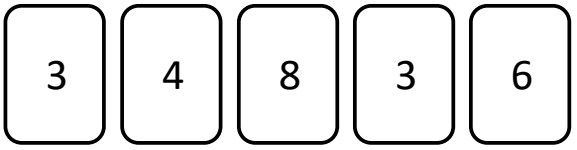
What are the ways can you make 15 using addition and subtraction with ***exactly 3*** cards in the hands dealt below?



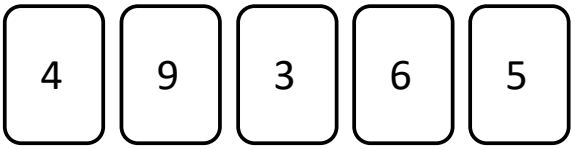
9 + 8 - 2 = 15



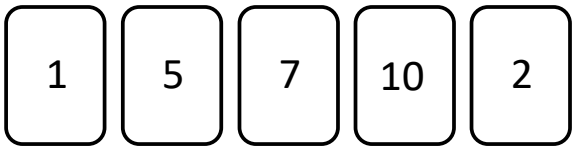
10 + 8 - 3 = 15



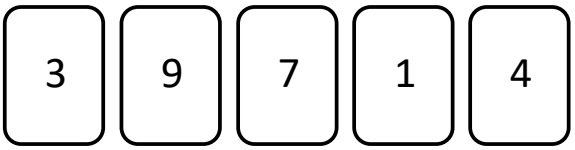
8 + 4 + 3 = 15



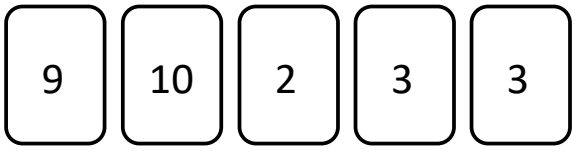
6 + 4 + 5 = 15



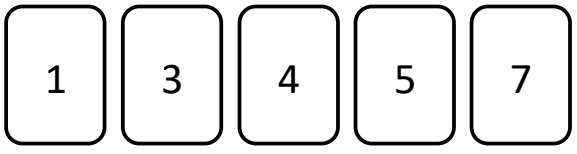
10 + 7 - 2 = 15



9 + 7 - 1 = 15



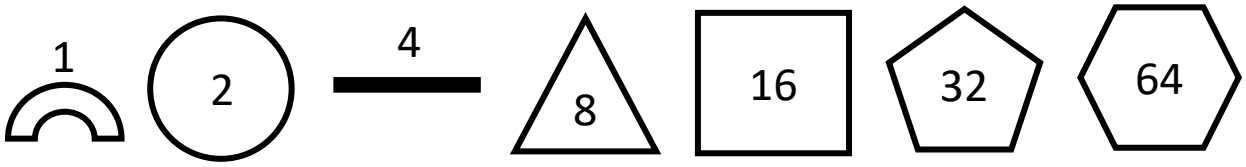
10 + 3 + 2 = 15



7 + 3 + 5 = 15

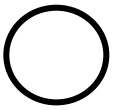
Binary exchange

In this game you have various tokens with different values. Your goal is to find ways to sum to a specific number with the tokens. ***You may only use a single one of each type of token to make the target number***. Our token values start at 1 and double in value as the tokens get more sides. Each person has a set of tokens. Players take turns between announcing target numbers and finding the tokens that sum to the target. Every 5 rounds, players share something about themselves.



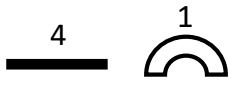
Which tokens do you use to make the following targets? Some have already been done for you. Remember to only ***use one or zero of each token***.

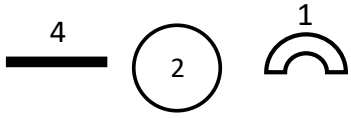
1  = 1

2  = 2

3  = 2 + 1

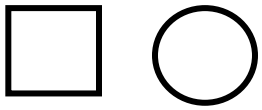
4 

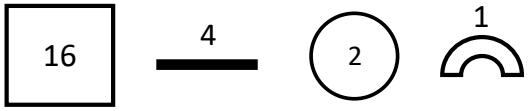
5 

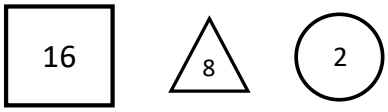
7 

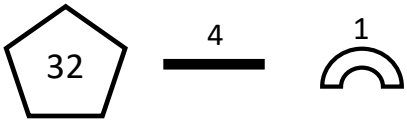
9 

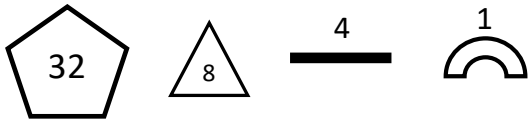
13 

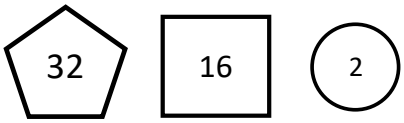
18  = 16 + 2

23 

26 

37 

45 

50 

Name:_____

Grade: ____ Teacher:_____

Make 24

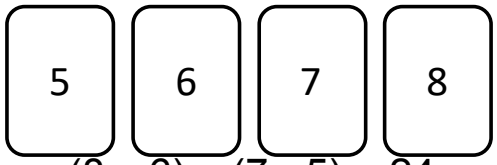
This game is about the various ways to make 24 with parenthesis, addition, subtraction, multiplication and division. You can play this with a deck of cards. Aces are 1, Jacks are 11, Queens are 12 and Kings are 13. To play, take turns between dealing 4 cards onto a surface and finding a way to add, subtract, multiply and divide using ***all 4 cards*** dealt to make 24. The dealer double checks the finder's answer. Every 5 rounds players talk about a favorite food.

For example, if the 4 cards that are dealt are 2 diamonds, 6 hearts, 9 spades, 3 hearts then we can make 24 by subtracting the 2 diamonds and 3 hearts from the 9 spades to get 4 and then multiple by the 6 hearts to get 24.

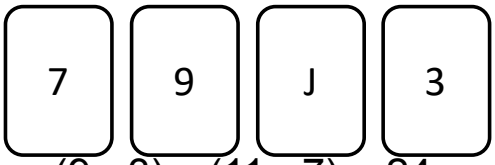
(9-3-2)*6 = 24
4*6 = 24

What are the ways can you make 24 ***with all 4 cards*** by using parenthesis, addition, subtraction, multiplication and division in the hands dealt below?

THERE ARE MULITPLE SOLUTIONS - HERE ARE SOME

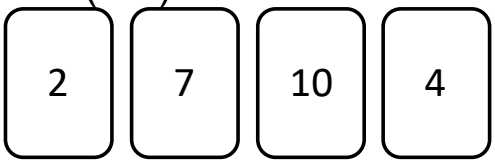


(8 x 6) ÷ (7 - 5) = 24
(5 - (8-7)) x 6 = 24

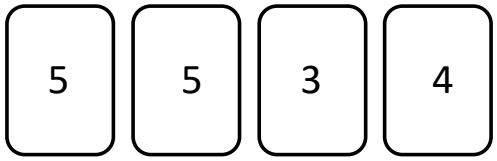


(9 - 3) x (11 - 7) = 24
(7-3) + 11 + 9 = 24

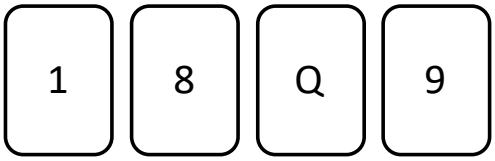
12 + 6 + 4 + 2 = 24



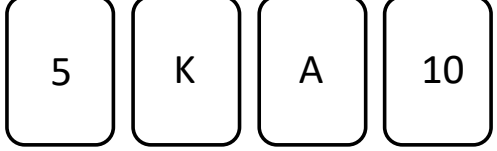
(10 - 7) x 4 x 2 = 24



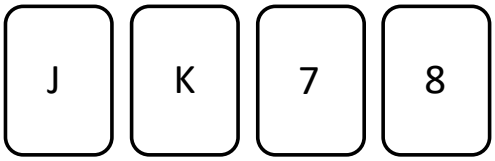
(5 x 5) - (4 - 3) = 24
(5x3)+5+4 = 24



12 x (9 - 8 + 1) = 24



(13 - 1) x (10/5) = 24

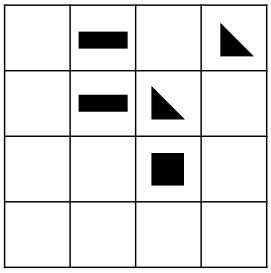


(13 + 11) x (8 - 7) = 24

Name:_____
Grade: ____ Teacher:_____

Shapes in a Square

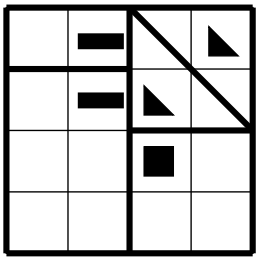
In this puzzle, we divide up the square below into smaller shapes by drawing lines to create triangles, squares or rectangles. We may only draw lines on the horizontal and vertical grid lines or across a diagonal grid square. Each shape we draw must have exactly one shape icon in it. Also, each shape we draw must match the shape icon inside of it. Last rule – when you get frustrated stand up and do a dance to celebrate how hard you are working!

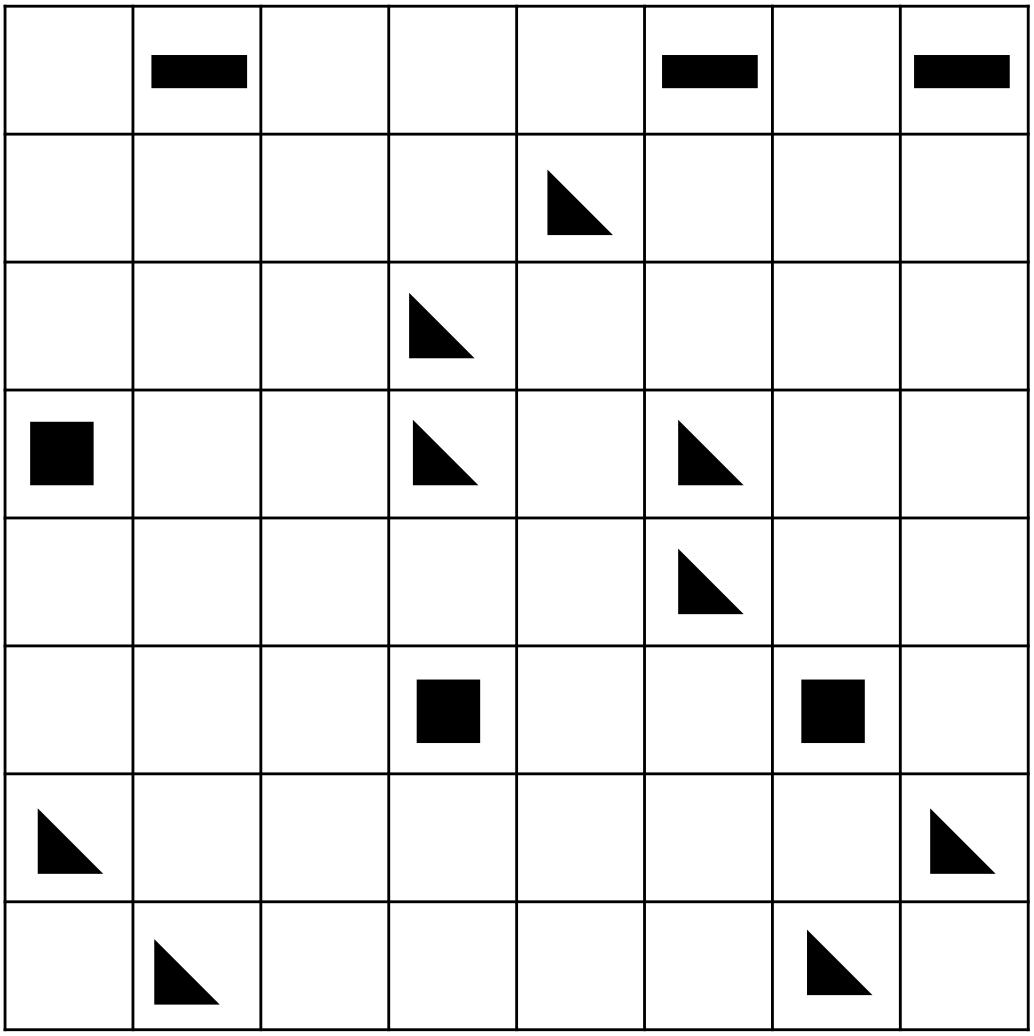


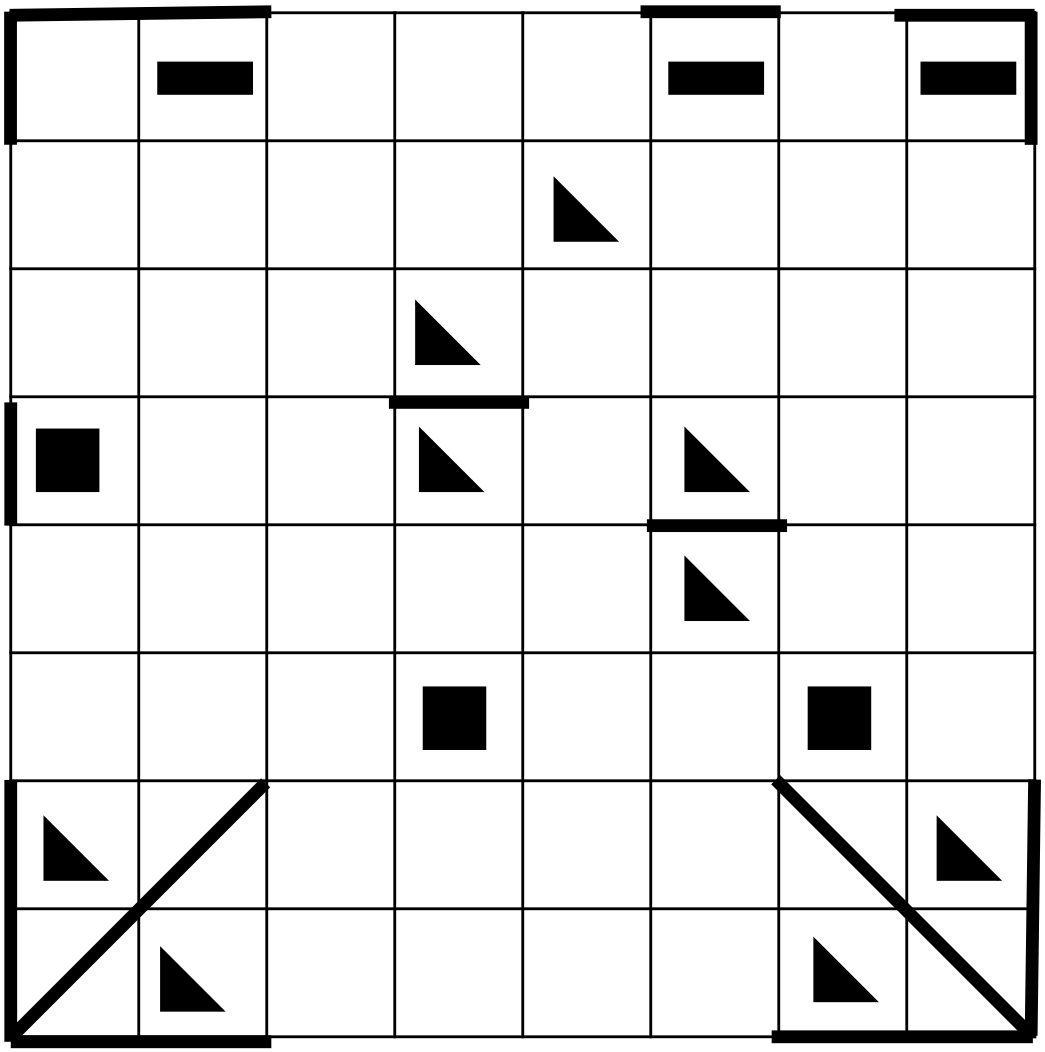
Example

➔

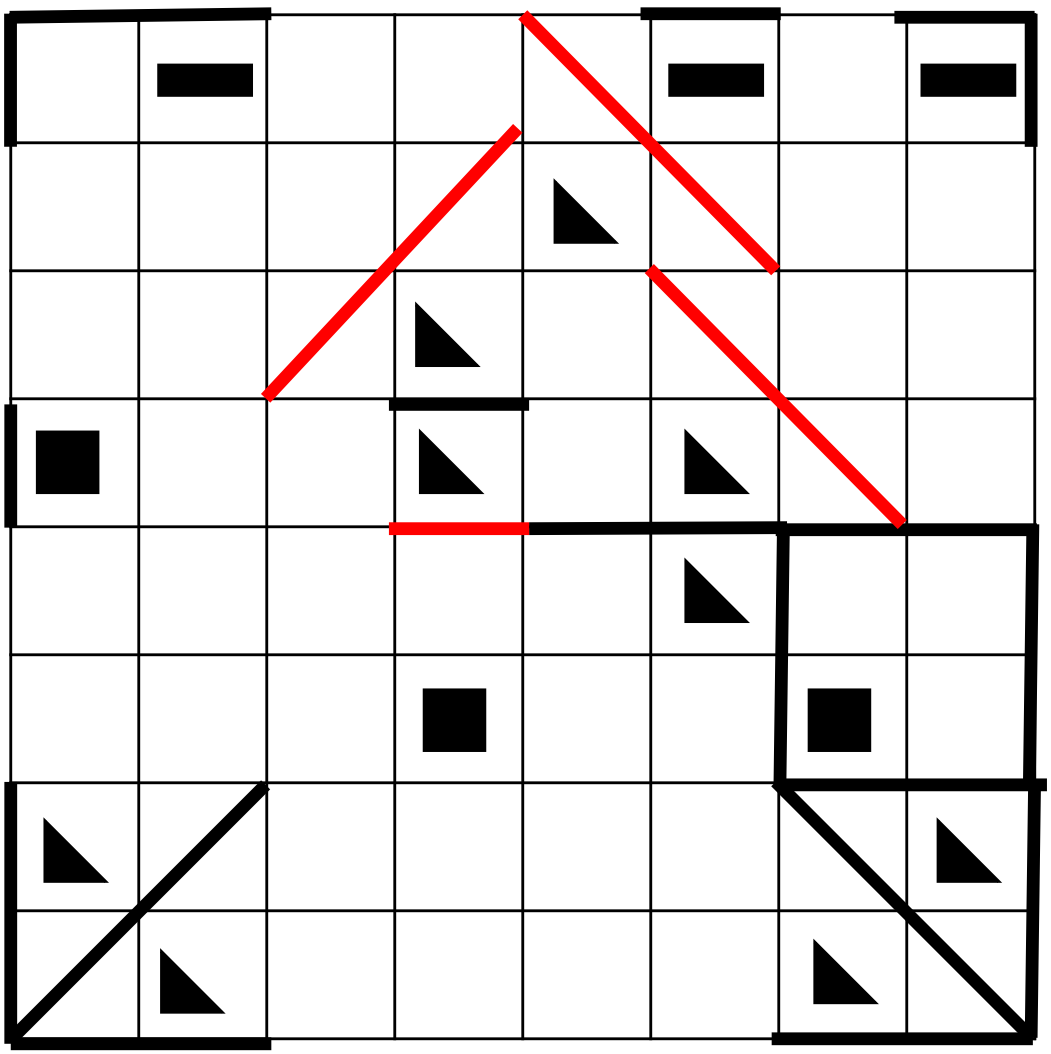
Hint: How do you include the corners?



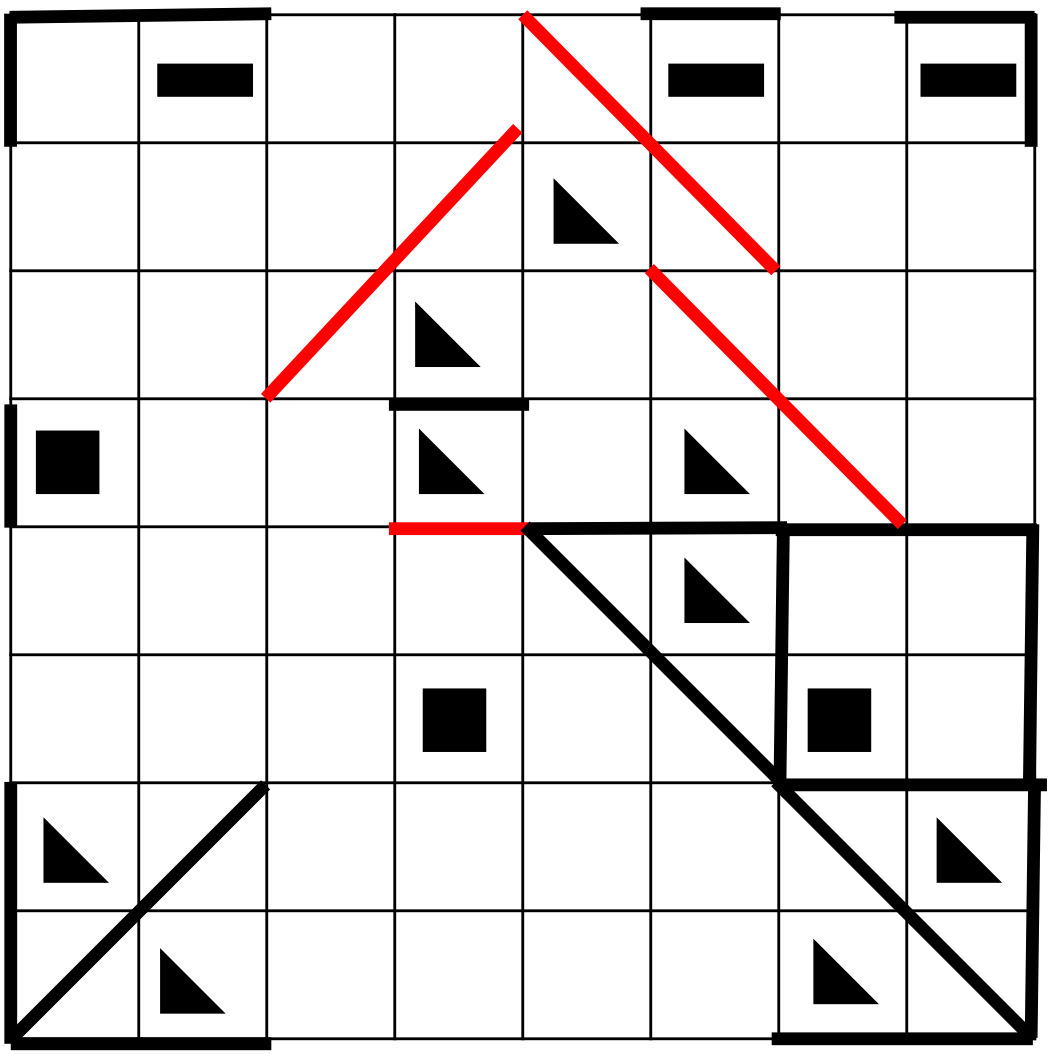




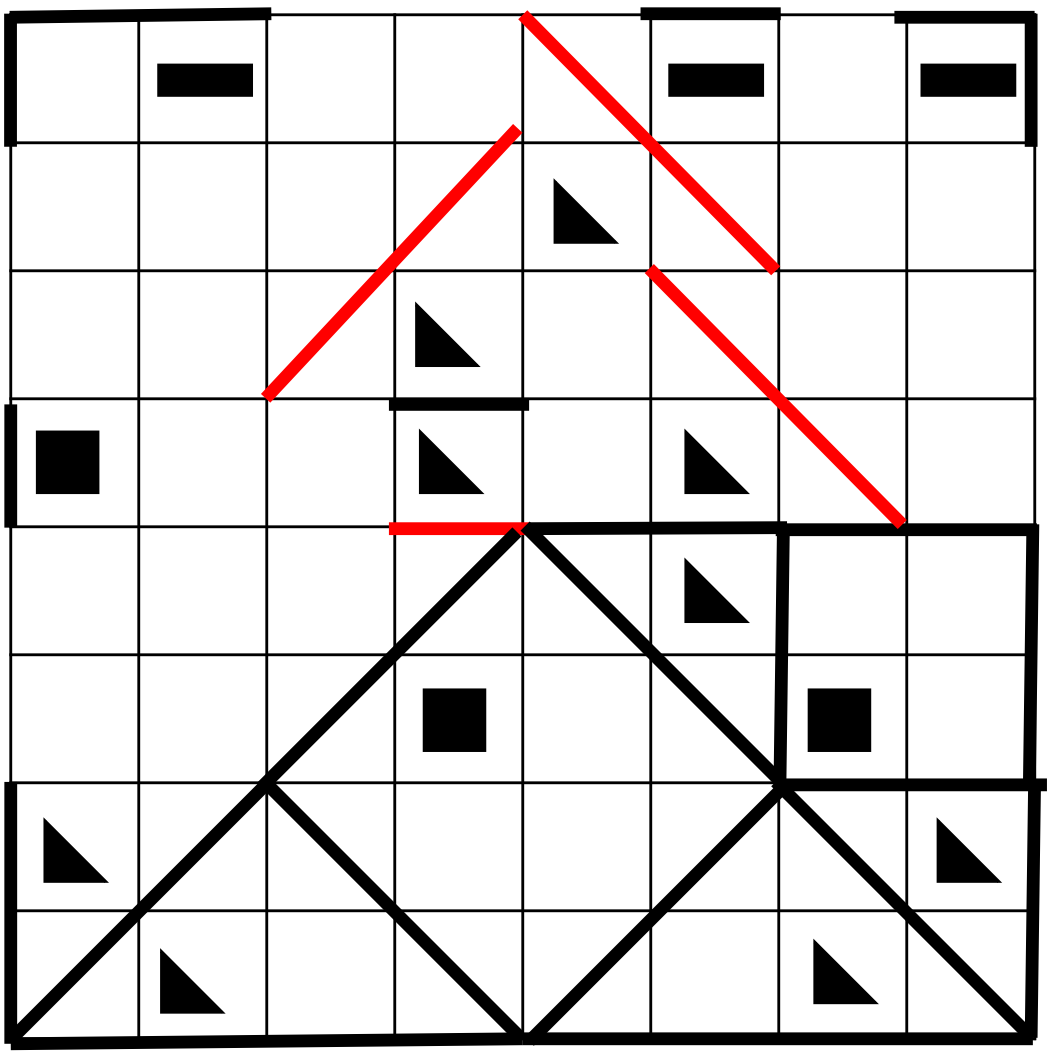
Red lines don't work.



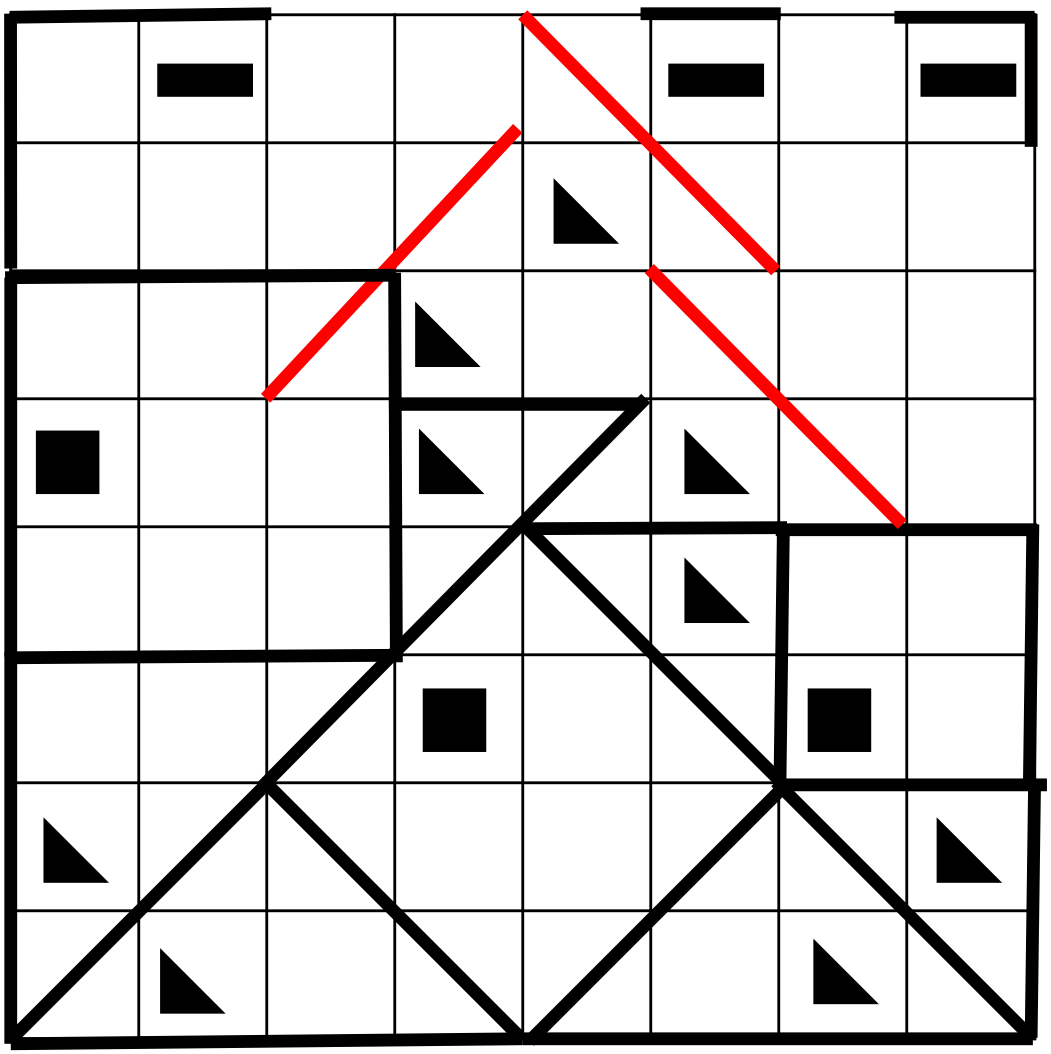
Red lines don't work.

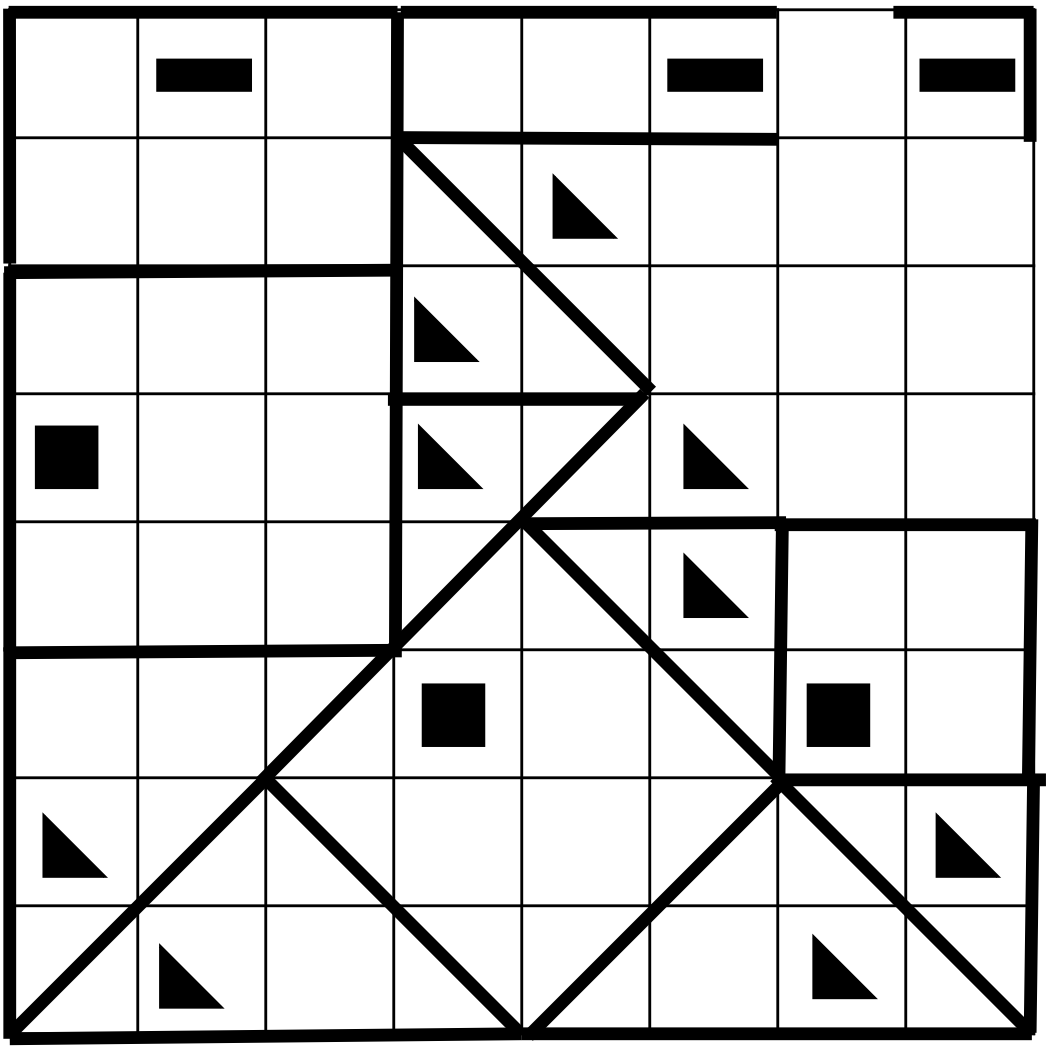


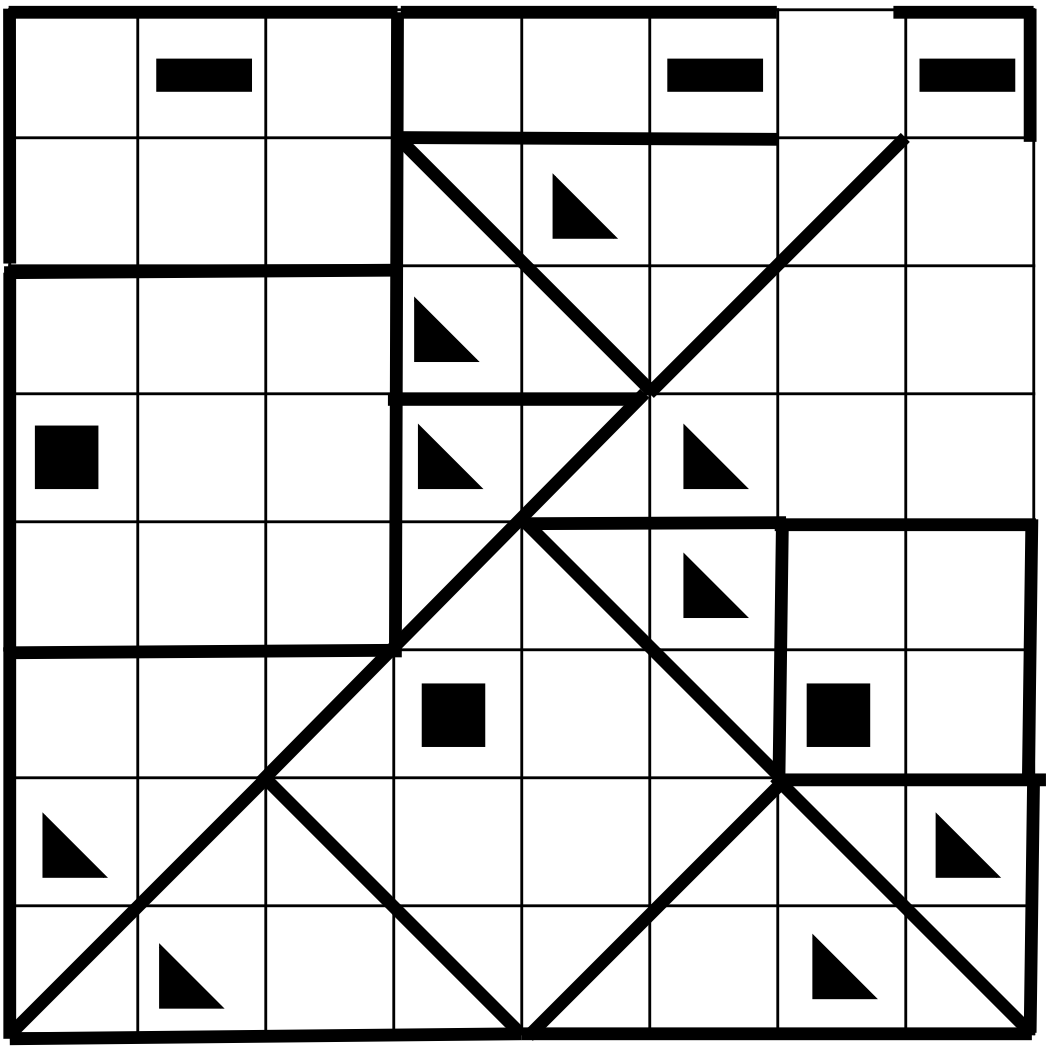
Red lines don't work.

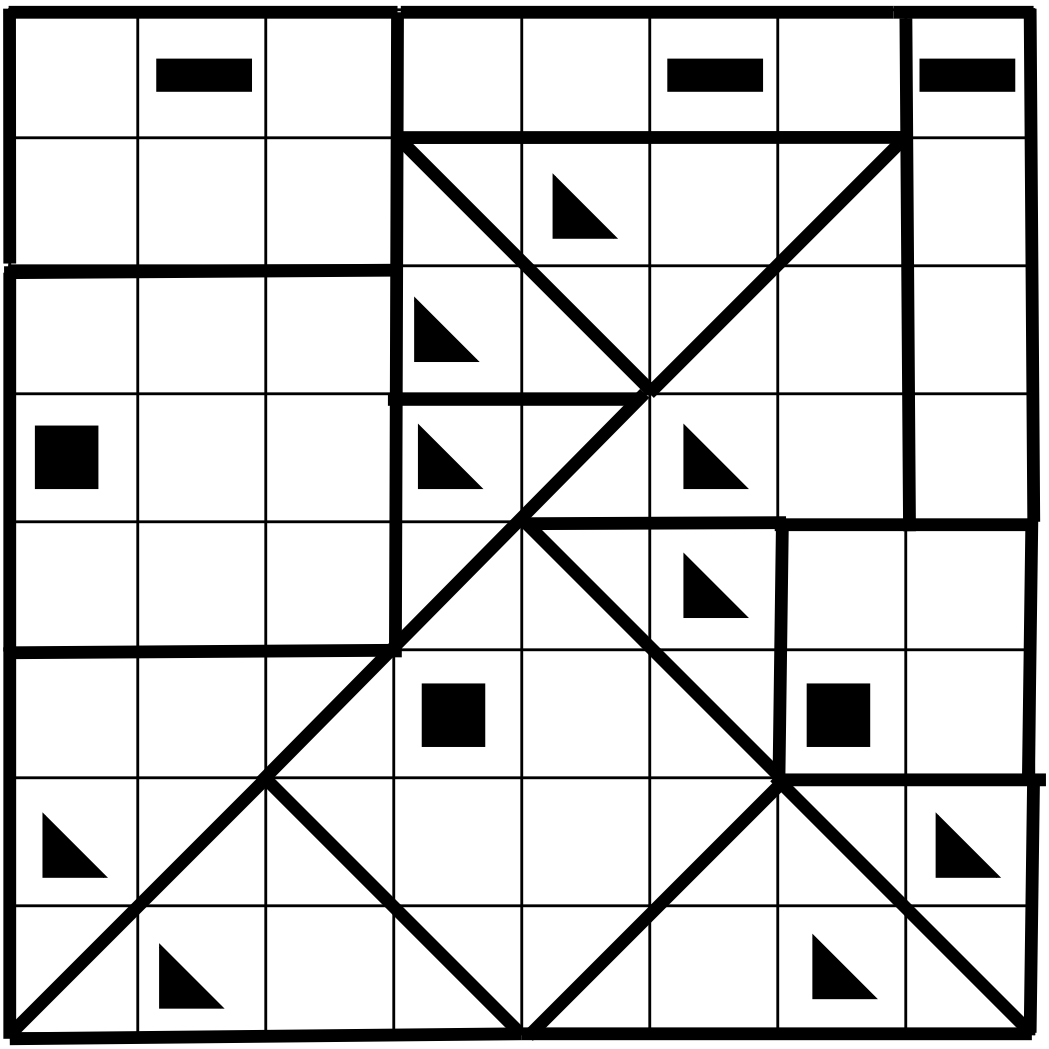


Red lines don't work.







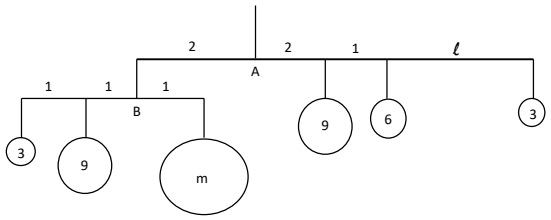


Name:_____
Grade: ____ Teacher:_____

Disco Ball Balance

We want to build a hanging disco ball decoration for our room. The decoration is made of disco balls, string and bars. In order for our artwork to balance, we have to follow two principles.

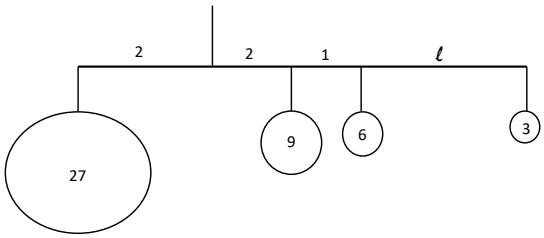
1) The sum of the products of the mass of the bodies times the distance from the suspension point on each side of the suspension point must equal.



Below at suspension point B,
m*1 = 9*1 + 3*(1+1)
m = 9 + 6
thus m = 15

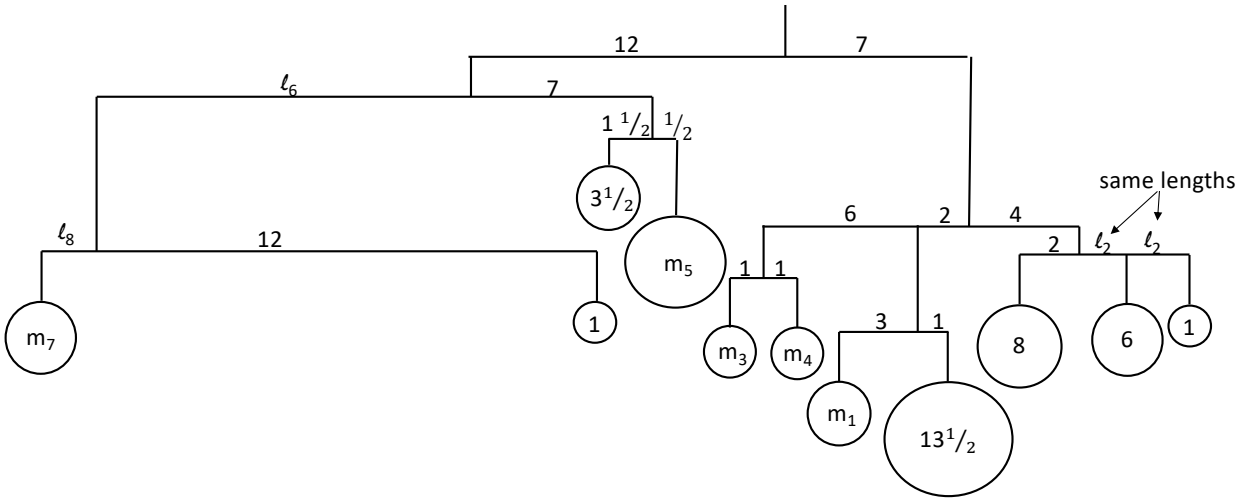
To find the length ℓ, we can simplify the diagram using the second principle.

2) The mass at the balance point equals the sum of the masses on the suspended bar.
This means that we can replace the bar and balls at suspension point B with a ball with mass 3 + 9 + 15 = 27. Now we can go back to the first principal to find length ℓ.



2* 27 = 9*2 + 6*(2+1) + 3*(2+1+ℓ)
54 = 18 + 18 + 3*(3+ℓ)
54 = 36 + 3*(3+ℓ)
18 = 3*(3+ℓ)
6 = (3+ℓ)
3 = ℓ

What are the missing lengths and masses below?



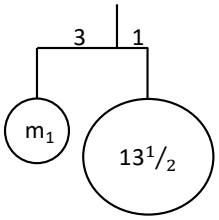
Name:_____

Grade: ____ Teacher:_____

m_1:

$1*13\ 1/2 = 3*m_1$

$m_1 = (27/2)\ /3 = 9/2 = 4\ 1/2$

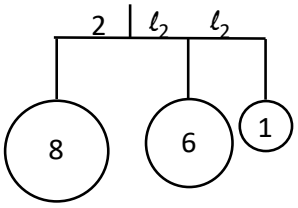


ℓ_2:

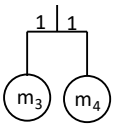
$8*2 = \ell_2*6 + (\ell_2 + \ell_2)*1$

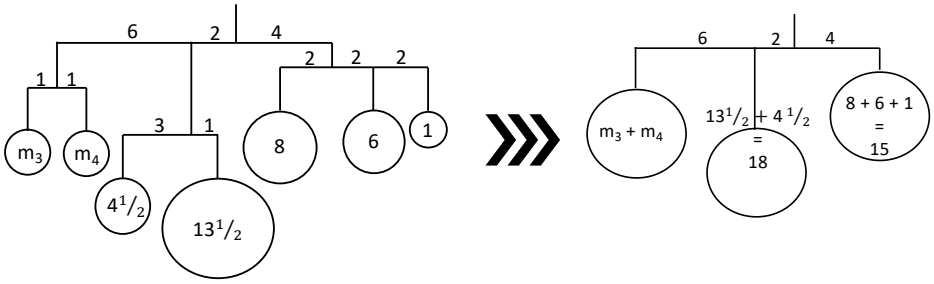
$8*2 = 8 * \ell_2$

$\ell_2 = 2$



m_3, m_4:





$1*m_3 = 1*\ m_4$

$m_3 = m_4$

$4*15 = 2*18 + 8*(m_3+m_4)$

$60 = 36 + 8*(m_3+m_4)$

$24 = 8*(m_3+m_4)$

$m_3+m_4 = 3$

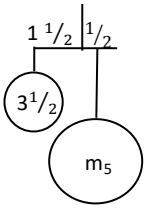
$m_3 = m_4 = 1\ 1/2$

m_5:

$3\ 1/2 * 1\ 1/2 = 1/2 * m_5$

$(7/2 * 3/2) / (1/2) = m_5$

$m_5 = 21/2 = 10\ 1/2$



Name:_____

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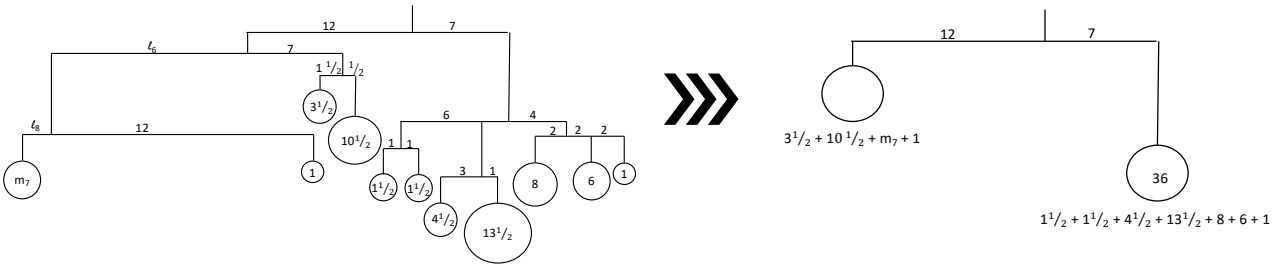
m_7:



$12 * (3\ 1/2 + 10\ 1/2 + m_7 + 1) = 7*36$

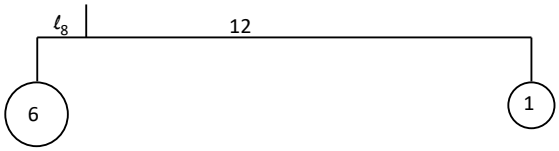
$15 + m_7 = 3*7$

$m_7 = 6$

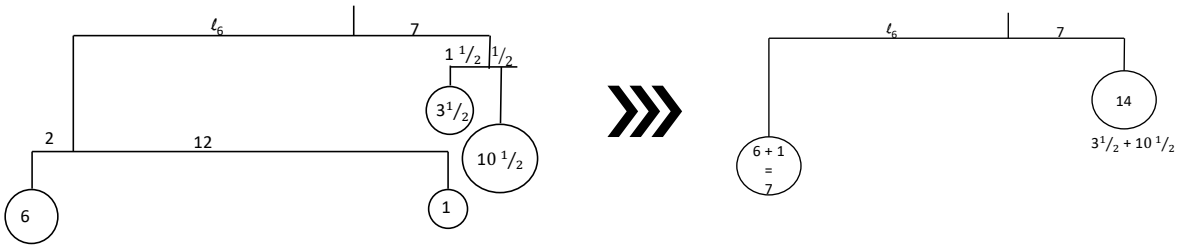
ℓ_8:

$\ell_8*6 = 12 * 1$

$\ell_8 = 2$



ℓ_6:



$\ell_6 * 7 = 7 * 14$

$\ell_6 = 14$

Name:_____

Grade: ____ Teacher:_____