Why Ask Why?
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“I suggest there are only two good reasons to ask questions in class: to cause thinking and to provide information to the teacher about what to do next.” (Dylan William)

Cell Phone Line Up

- Take out your cell phone.
- Think of your last two digits of your cell phone number.
- Line up from Least (Right)- to the Greatest (Left)
- Now share a picture with your shoulder partner.

Daily Learning Intentions

Today, participants will leave with…

…an understanding of how to develop questions using the

- sorting activity when introducing a new concept.
- task anticipation guide along with the depth and complexity icons or the question matrix when assigning a task.

Domain- RP

1

Glance over the 6th and 7th grade standards provided to you

2

On separate sticky notes or cards, script some typical questions you might ask about when working in ratio and proportional reasoning.

3

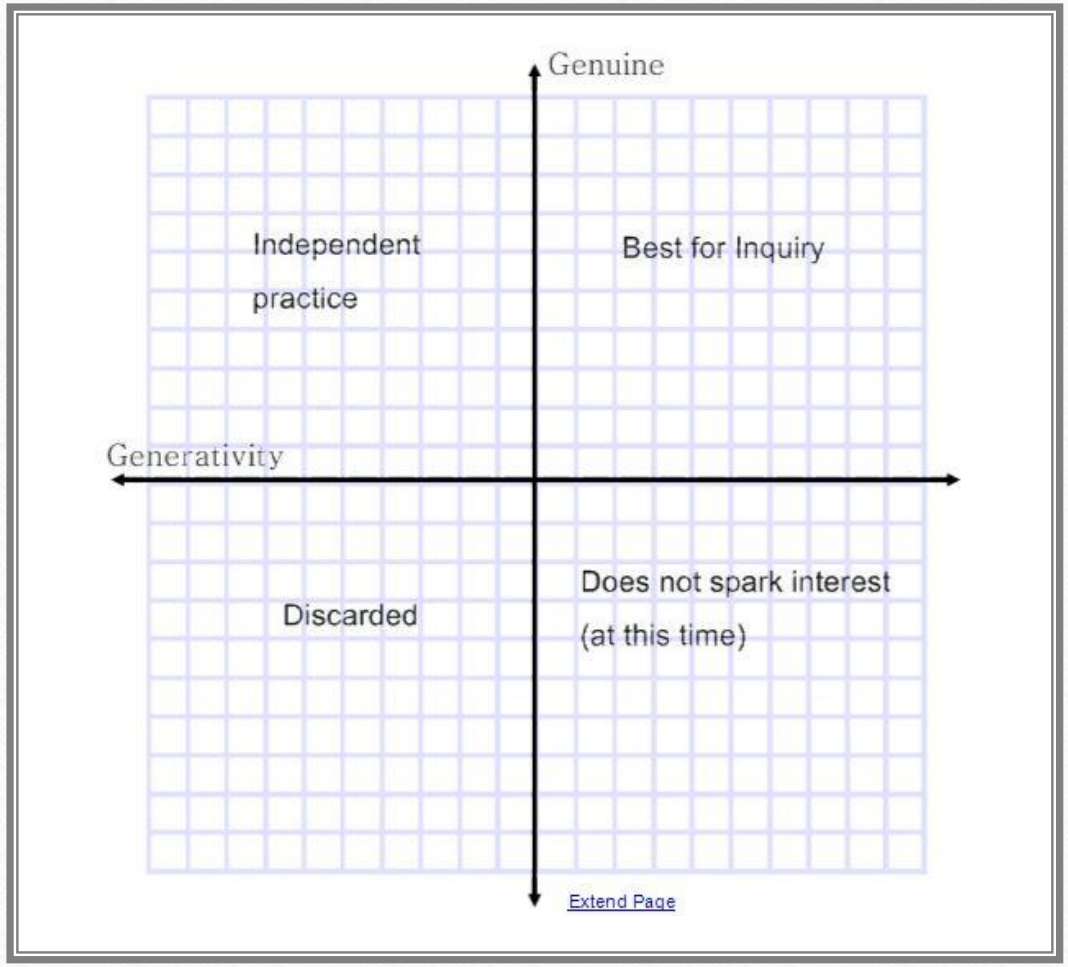
How we use this…

Question Sort

Now, use the horizontal continuum on the chart paper. This horizontal axis will represent generativity, that is, how likely will the question generate conceptual understanding among students. As a group, discuss and place each question on the continuum.

Question Sort

Use the vertical continuum intersecting the horizontal axis on the chart paper. This line represents how genuine, that is, how much will the students care about investigating the question. As a group, discuss and place each question by moving the post-it note up or down the continuum.

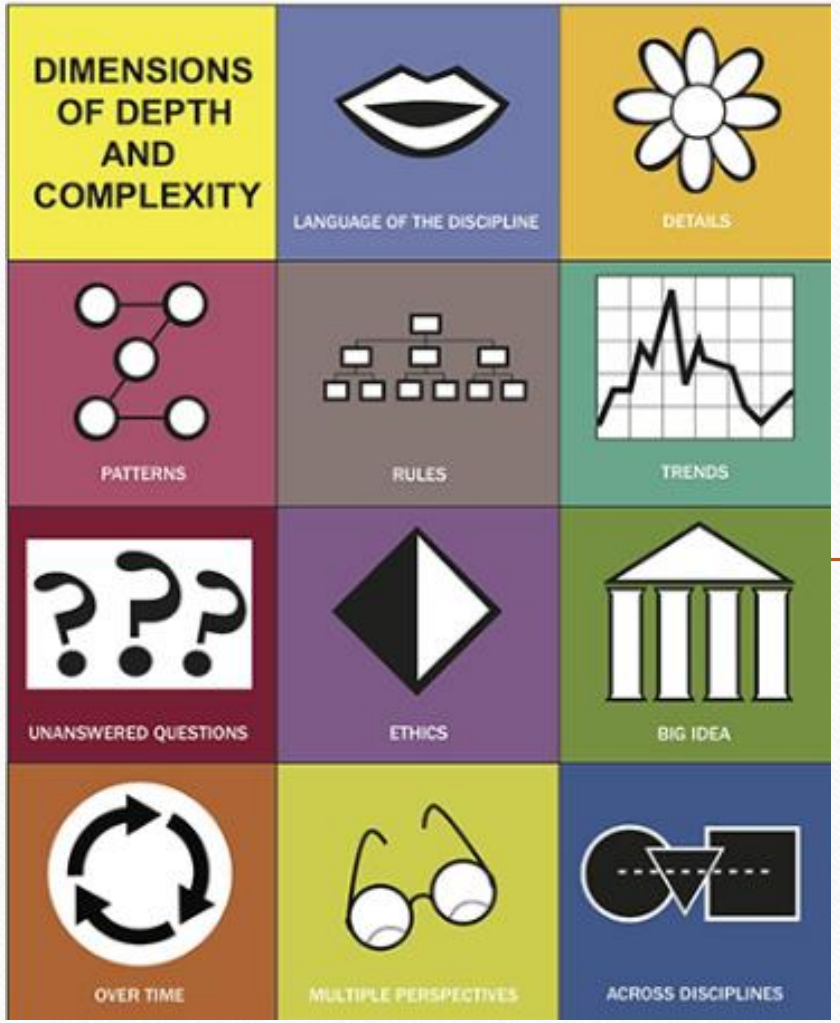


Coordinate Plane

How could you use this strategy in collaborative planning?

Popcorn Anyone?

- Today in school students will learn about popcorn.
- Write down two questions you might ask your students to get them to begin thinking about popcorn.



Depth and Complexity Icons

Mr. Tall and Mr. Short Task

When Mr. Short is measured in paper clips, he is 6 paper clips tall. When he is measured in buttons, he is 4 buttons tall.

Mr. Short has a friend named Mr. Tall. When Mr. Tall is measured in buttons, he is 6 buttons tall.

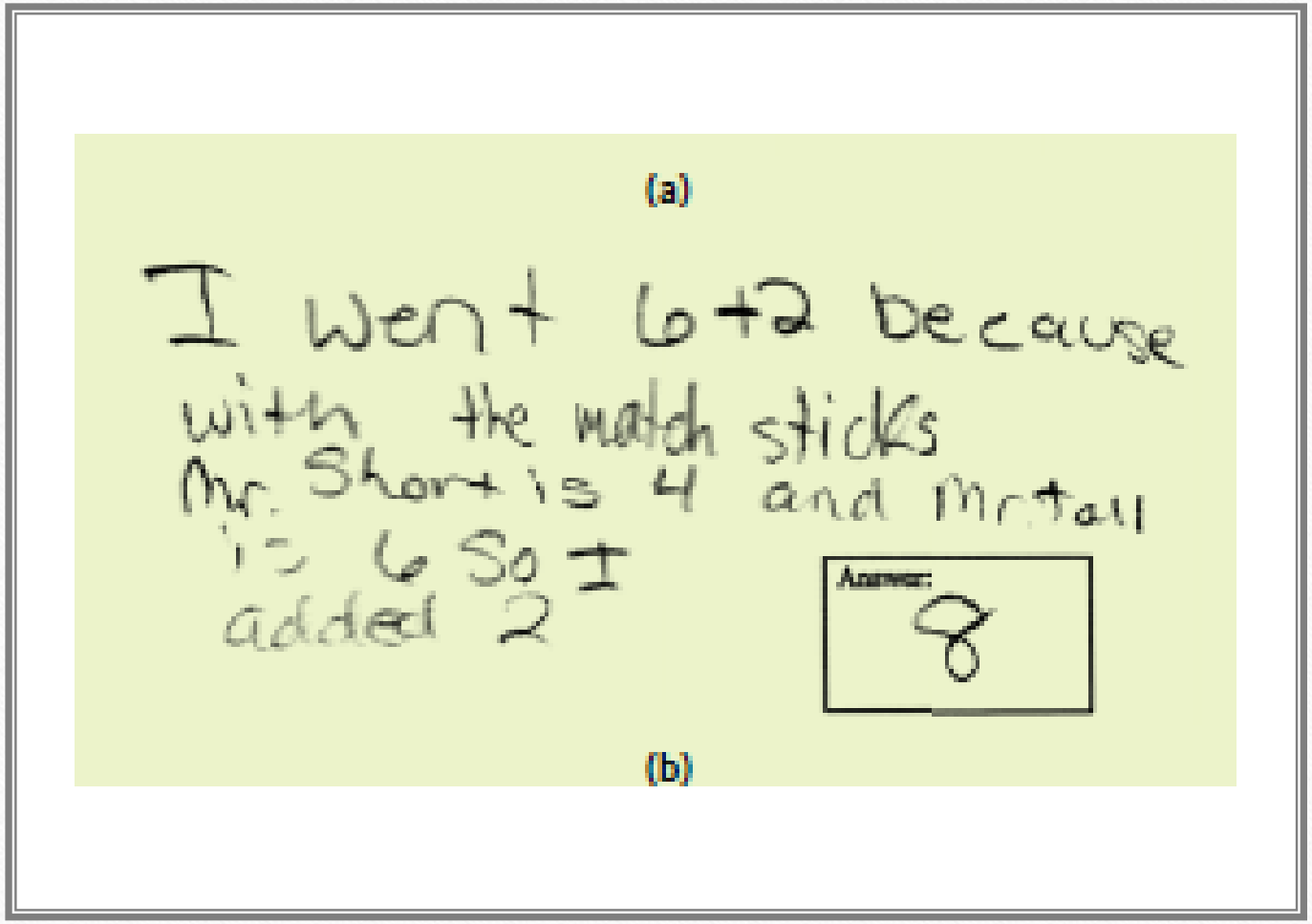
- How many paper clips tall is Mr. Tall?

Anticipation Guide

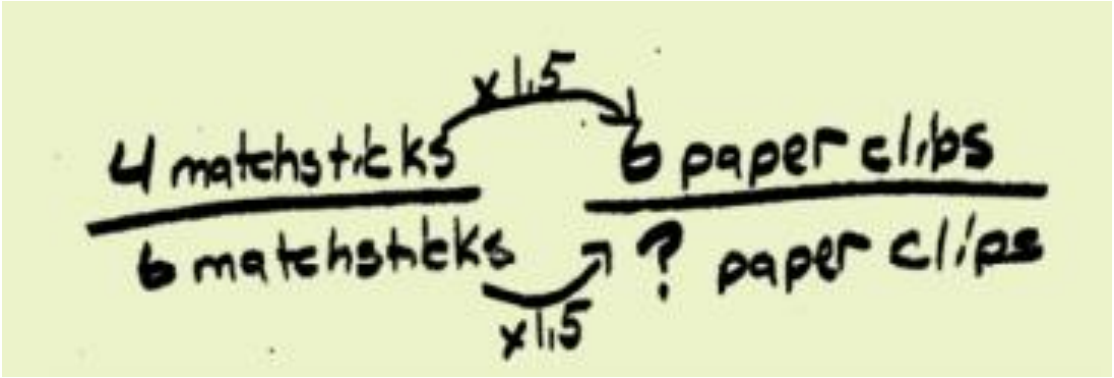
Solve in as many ways as possible.

Where will students show success?

Where will students struggle?

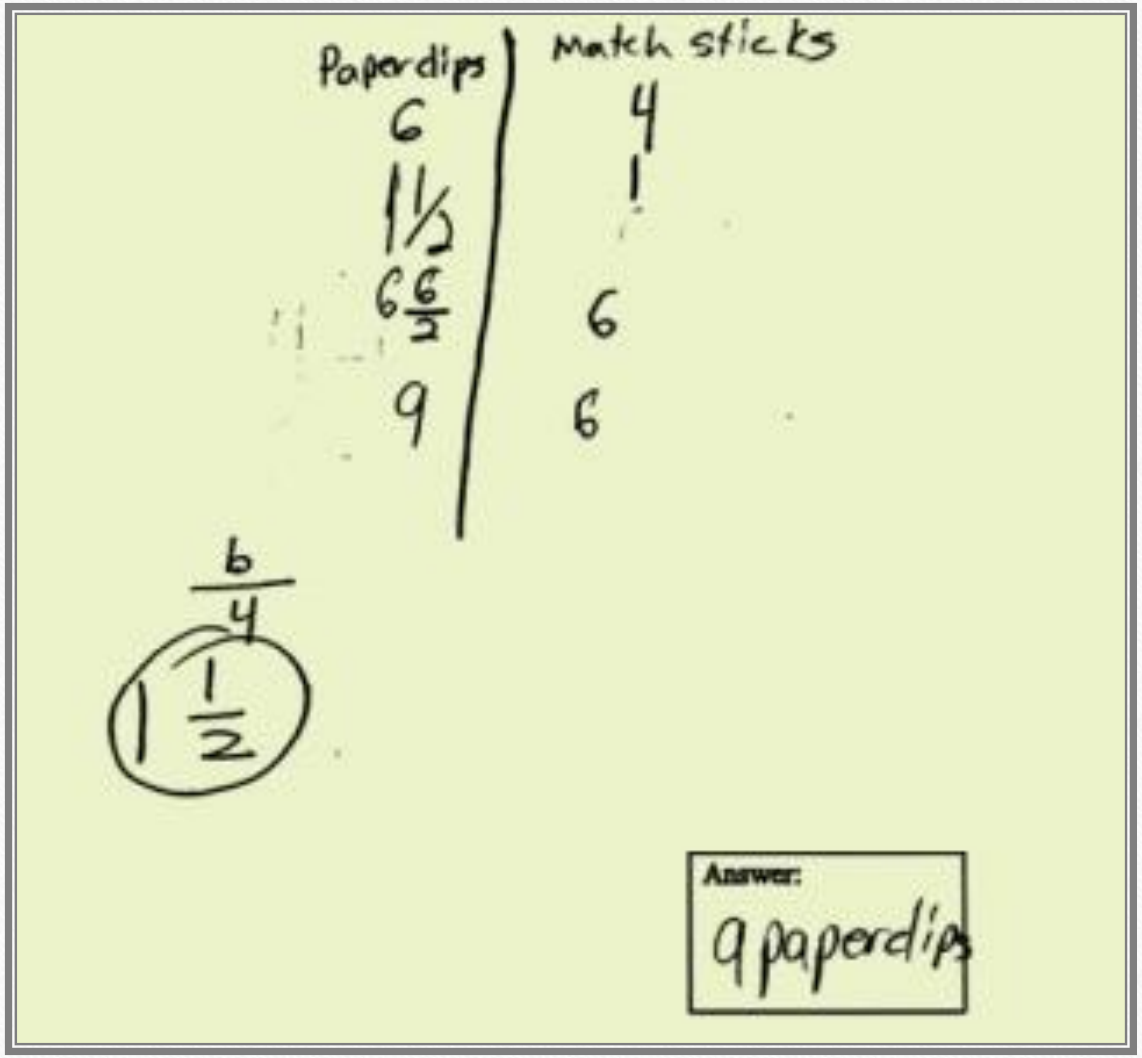

(a)
I went 6+2 because with the match sticks Mr. Short is 4 and Mr tall is 6 So I added 2
Answer:
8
(b)

Examples

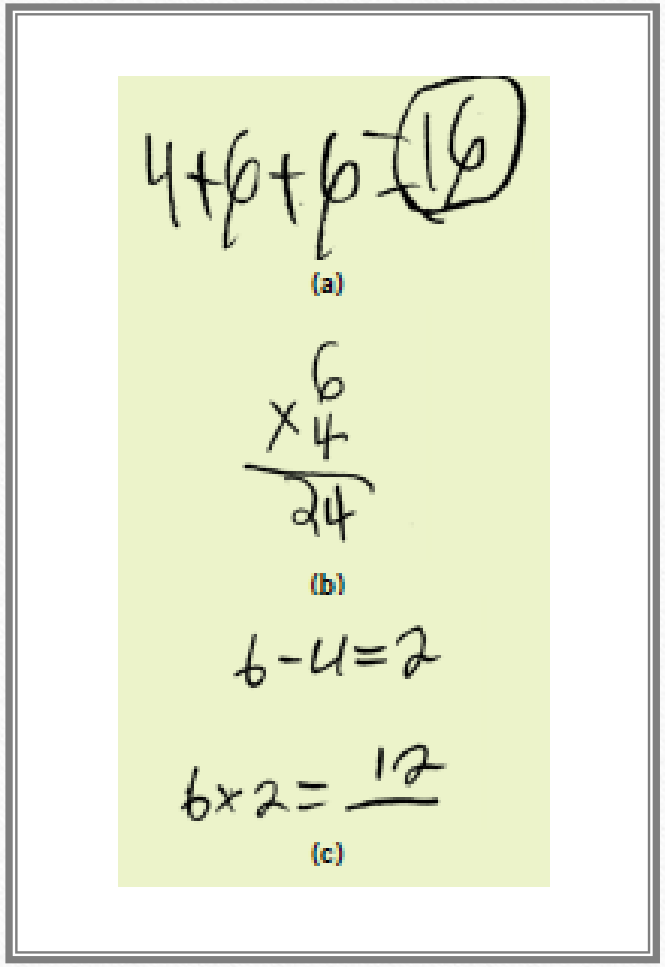

x1.5
4 matchsticks
6 paper clips
6 matchsticks
? paper clips
x1.5

Examples

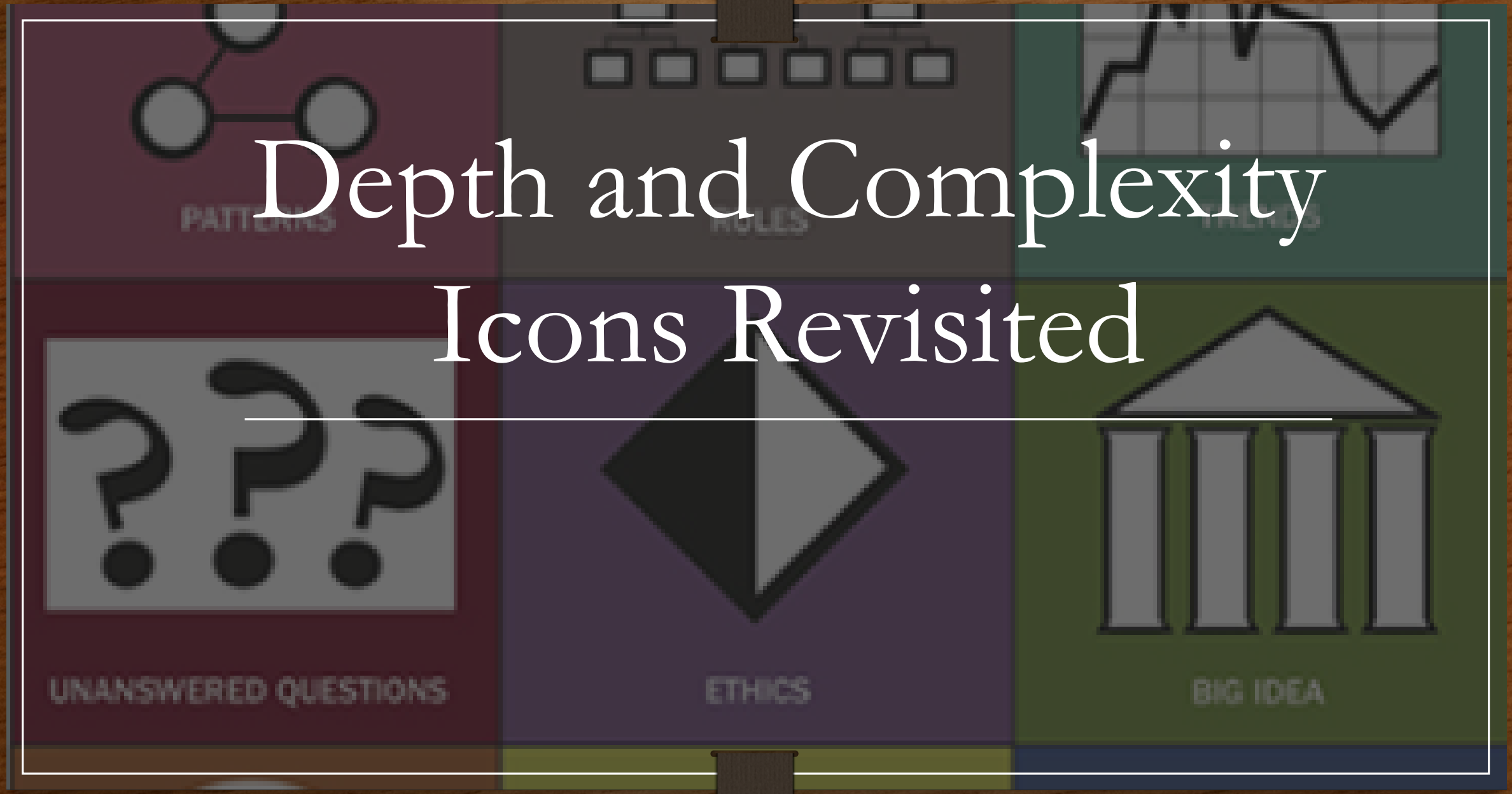
Examples


Paperclips
Match sticks
6
4
1½
1
6 6/2
6
9
6
6/4
1 1/2
Answer:
9 paperclips

Examples



Depth and Complexity Icons Revisited

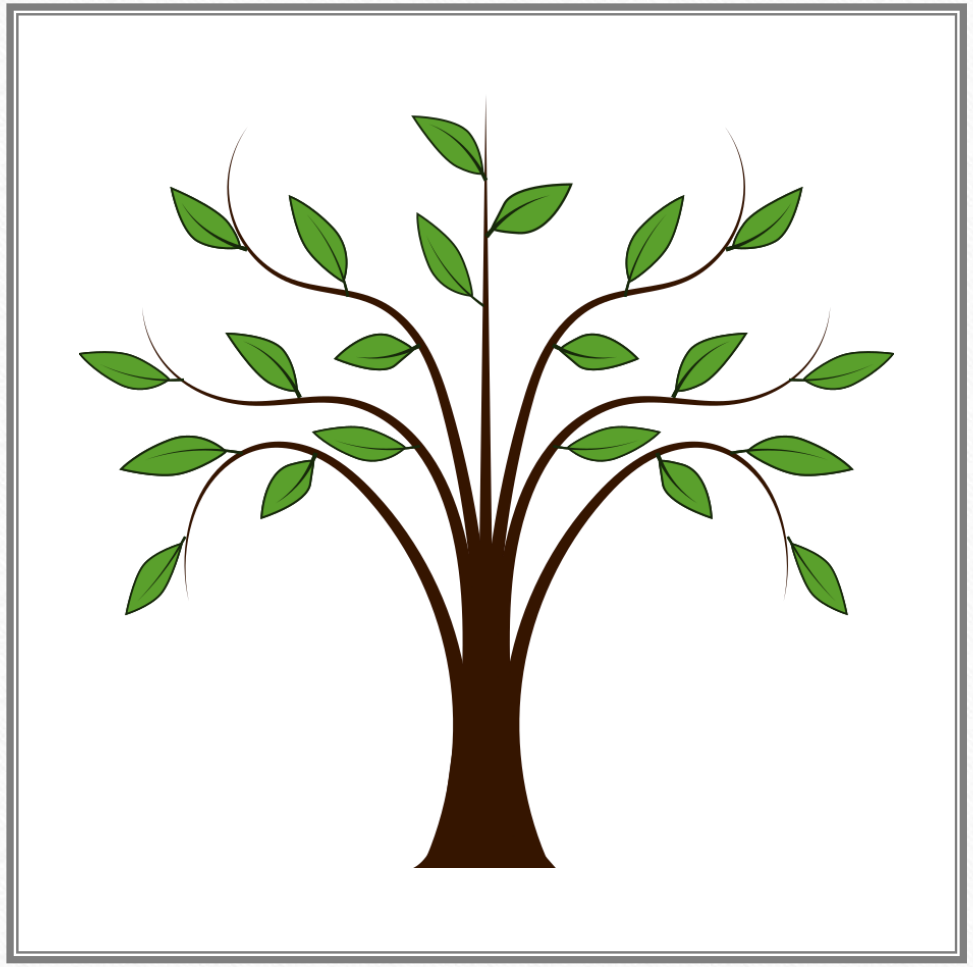


Pruning Trees Task

It takes Keith 45 minutes to prune a tree. It takes Richard 70 minutes to a prune a tree. They form a company and agree to prune 92 trees.

•If they both work at the same time and at constant rates, how long will it take them to prune all 92 trees?

• How many trees will each have pruned?



Anticipation Guide

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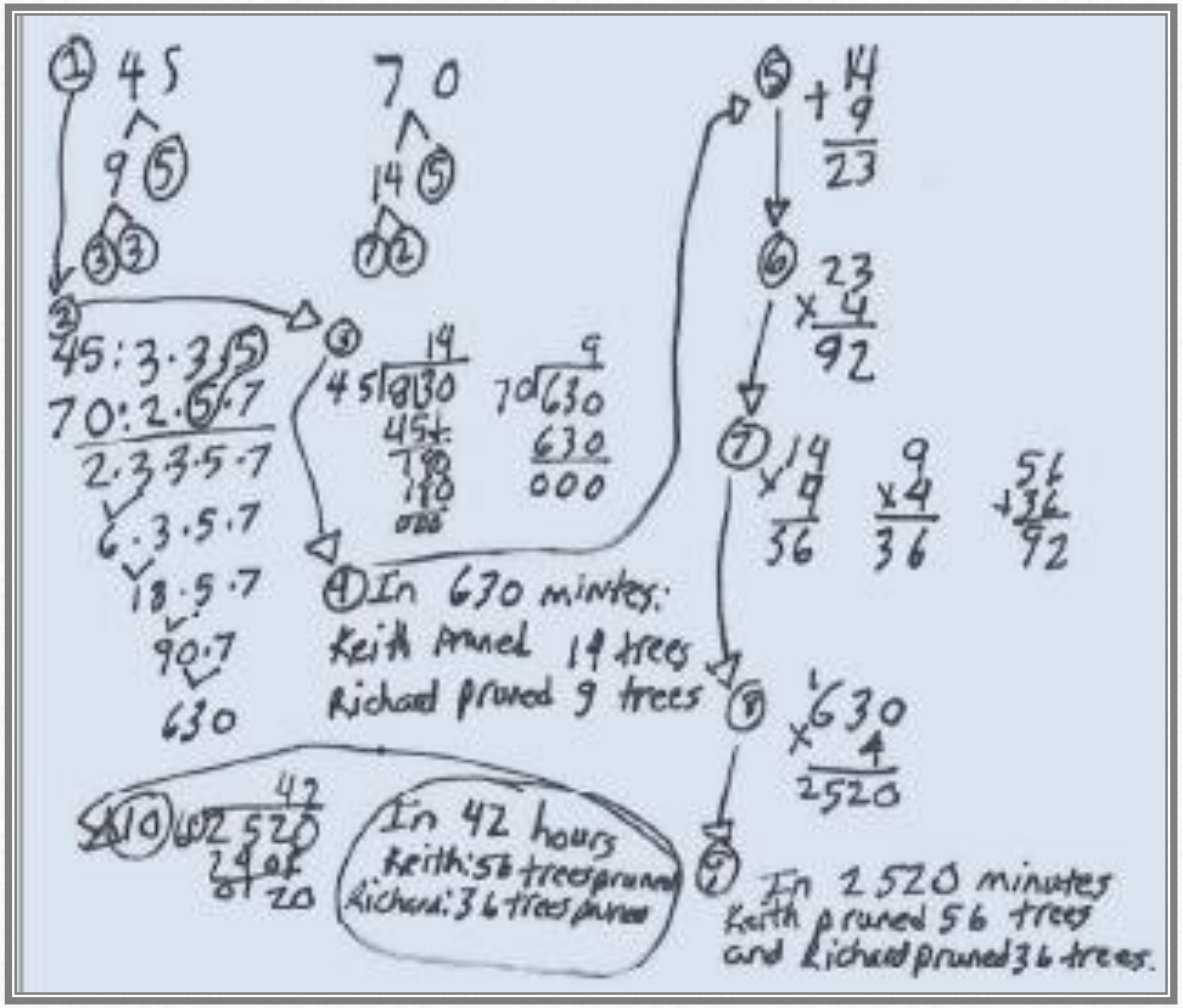
Examples

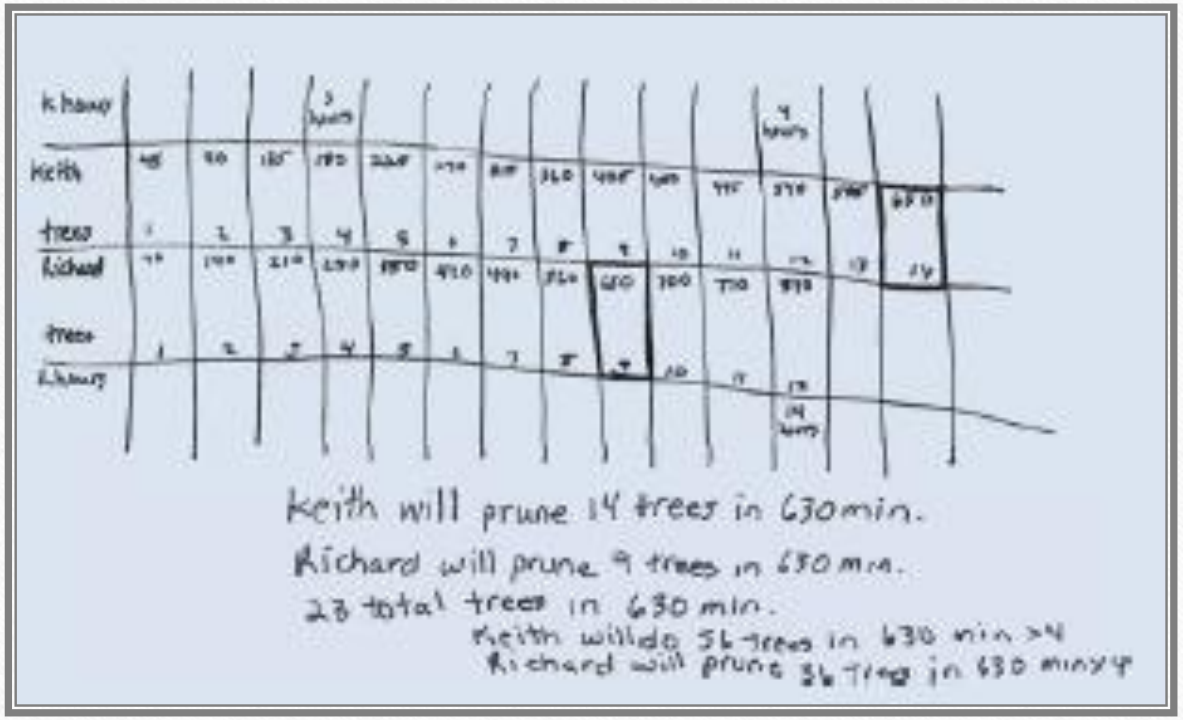

45
9 5
3 3
45 : 3 · 3 · 5
70 : 2 · 5 · 7
2 · 3 · 3 · 5 · 7
6 · 3 · 5 · 7
18 · 5 · 7
90 · 7
630
70
14 5
7 2
14
45 630
45
180
180
000
9
70 630
630
000
In 630 minutes:
Keith pruned 14 trees
Richard pruned 9 trees
42
10 420
420
0
In 42 hours
Keith: 56 trees pruned
Richard: 36 trees pruned
14
+ 9
23
23
x 4
92
14
x 9
36
9
x 4
36
56
+ 36
92
630
x 4
2520
In 2520 minutes
Keith pruned 56 trees
and Richard pruned 36 trees.

Examples

Keith: 45 min, 1 tree
Richard: 70 min, 1 tree

Keith		Richard	
1 tree	45 min	1 tree	70 min
2 trees	90 min	2 trees	140 min
3 trees	135 min	3 trees	210 min
4 trees	180 min	4 trees	280 min
5 trees	225 min	5 trees	350 min
6 trees	270 min	6 trees	420 min
7 trees	315 min	7 trees	490 min
8 trees	360 min	2 trees	560 min
9 trees	405 min	9 trees	630 min
10 trees	450 min		
11 trees	495 min		
12 trees	540 min		
13 trees	585 min		
14 trees	630 min		

Examples


Keith will prune 14 trees in 630 min.
Richard will prune 9 trees in 630 min.
23 total trees in 630 min.
Keith will do 56 trees in 630 min x4
Richard will prune 36 trees in 630 min x4

Examples

Richard can cut 60/70 or 6/7 of a tree in an hour.

Keith can cut 60/45 or 4/3 trees in an hour.

Together, they can prune 6/7 + 4/3 trees in an hour.

By using common denominators, they can cut 18/21 + 28/21 which equals 46/21 trees per hour.

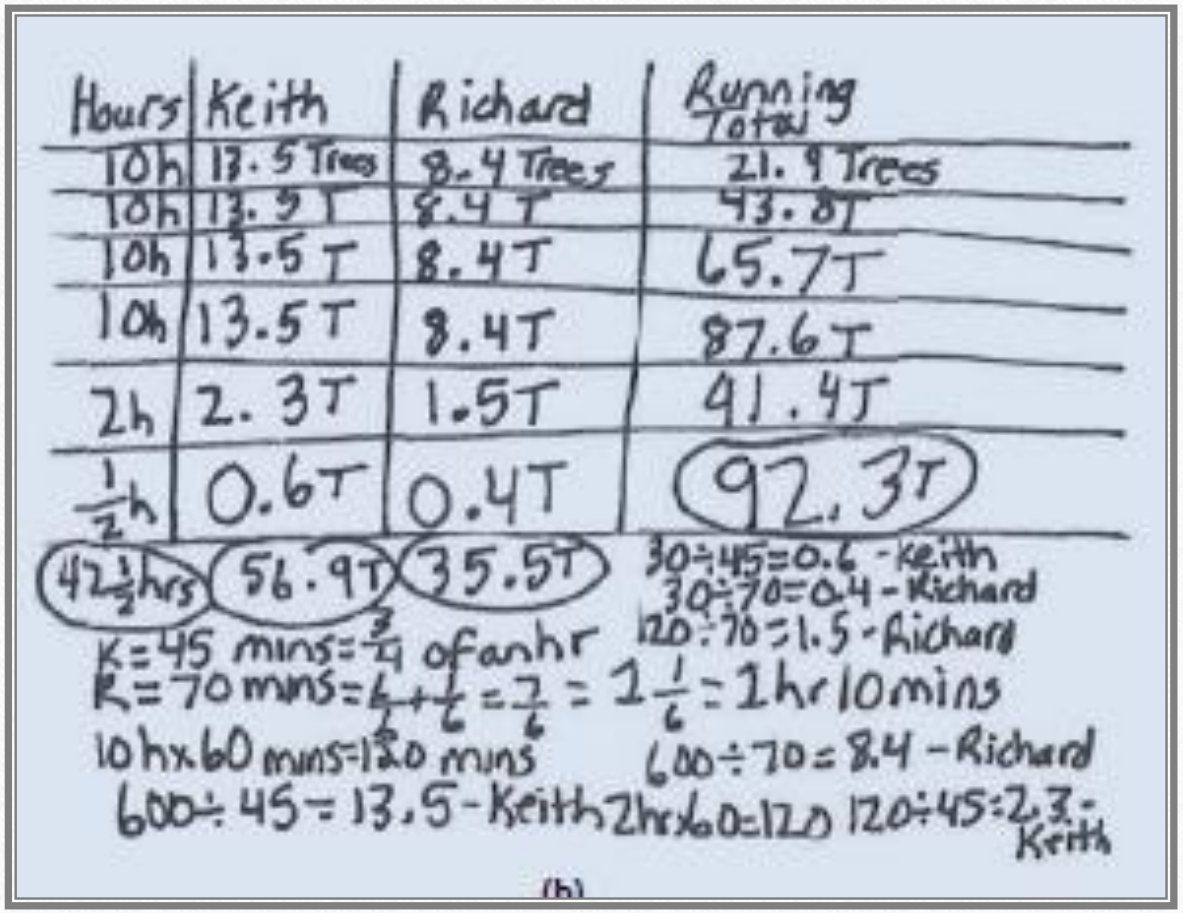
In order to cut 92 trees it will take them 92 divided by 46/21.

92/1 x 21/26 = 1932/46 or 42 hours to prune all trees

Then Keith prunes 4/3 trees/hour x 42 hours or 168/3 trees which is 56 trees.

And, Richard prunes 6/7 trees/hour x 42 hours or 252/7 which is 36 trees.

Examples



Hours	Keith	Richard	Running Total
10h	13.5 Trees	8.4 Trees	21.9 Trees
10h	13.5 T	8.4 T	43.8T
10h	13.5 T	8.4T	65.7T
10h	13.5T	8.4T	87.6T
2h	2.3T	1.5T	91.4T
$\frac{1}{2}$h	0.6T	0.4T	92.3T
42$\frac{1}{2}$hrs	56.9T	35.5T	

K=45 mins=$\frac{3}{4}$ of an hr
K=70 mins=$\frac{6}{6}+\frac{1}{6}=\frac{7}{6}=1\frac{1}{6}$=1hr 10mins
10hx60 mins=120 mins
600÷45=13.5-Keith 2hrx60=120 120÷45=2.3-Keith

30÷45=0.6-Keith
30÷70=0.4-Richard
120÷70=1.5-Richard
600÷70=8.4-Richard

(b)

QUESTION MATRIX – Chuck Wiederhold						
	Event	**Situation**	**Choice**	**Person**	**Reason**	**Means**
Present	What is?	Where When is?	Which did?	Who is?	Why is?	How is?
Past	What did?	Where When did?	Which did?	Who did?	Why did?	How did?
Possibility	What can?	Where When can?	Which can?	Who can?	Why can?	How can?
Probability	What would?	Where When would?	Which would?	Who would?	Why would?	How would?
Prediction	What will?	Where When will?	Which will?	Who will?	Why will?	How will?
Imagination	What might?	Where When might?	Which might?	Who might?	Why might?	How might?

PADLET-PHONE

Reflection

Leave us a note and record ONE word that best illustrates your learning from today.

Also if you have a question please post here.

https://padlet.com/smotsco/nctm2018