

Nā Hanana o ka Mokuna 5



Hanana 5.1: Ke Kūkulu Hō'ōia o ka Mana'oha'i 'o Paekakoleo

'Ōlelo Mua:

Pa'akikī ka loa'a o nā pono kūkulu hale ma ka moana Pākīpika. He pōmaika'i na'e ka 'ike a ka po'e Pākīpika i ka ho'ohana i nā mea mai ko lākou 'āina. I la'a me kēia, kūkulu ka po'e Maikonekia i ka wa'a nui me ka humu a nāki'i 'ana i nā 'āpana lā'au li'i'ili'i a pa'a. Ulana ka po'e Hawai'i i nā lau li'i'ili'i i nā moena nunui a me nā pe'a wa'a. Ma kēia hanana, e a'o kākou i ka ho'onui i kekahi huinahā like ma o ka ho'ohana i 'elua huinahā like li'i'ili'i me ka 'uha'uha 'ole i nā pono. E a'o pū kākou i ka Mana'oha'i 'o Paekakoleo.



Nā Pono Hana:

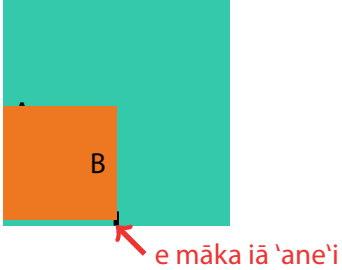

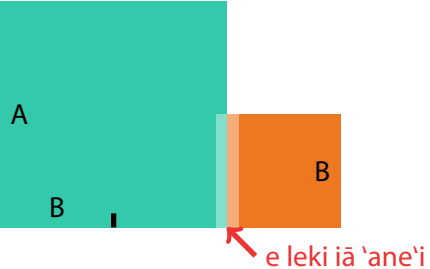
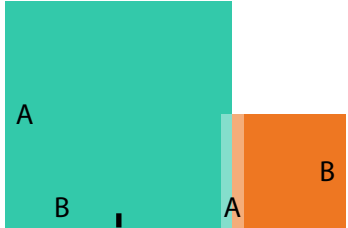
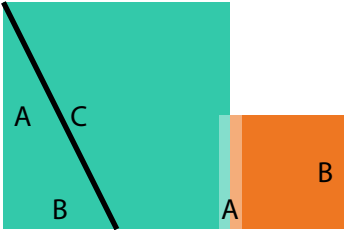
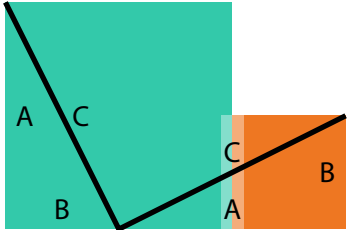
1. 2 'Āpana pepa, he huinahā ke kinona, 'oko'a ka nui
2. Penikala/Peni
3. Lula
4. Leki
5. 'Ūpā

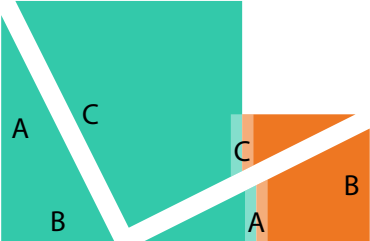
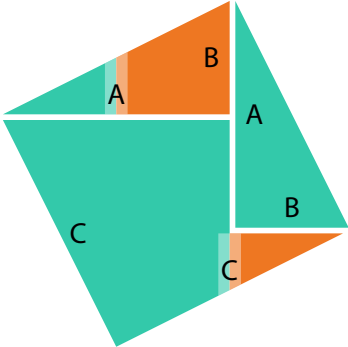
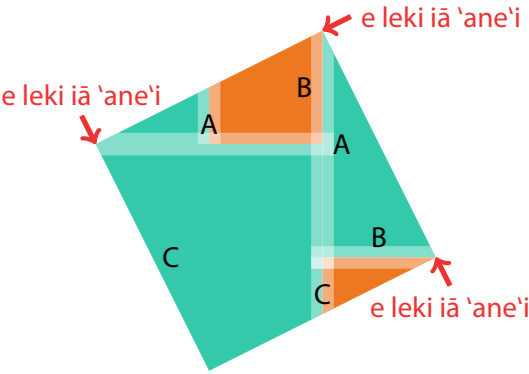
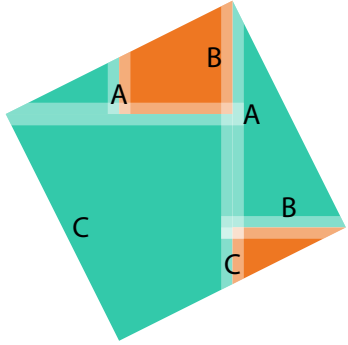
Hana:

Wehewehe kēia Mana'oha'i 'o Paekakoleo inā 'o A , B , me C nā lō'ihī o ka huinakolu kūpono, a 'o C ka lō'ihī o ka lala kūpono, a laila $A^2 + B^2 = C^2$. E hō'ōia kākou i kēia hanana.

1. 'O ka mua, e hana i 'elua huinahā. 'O A ka lō'ihī o nā 'ao'ao o ka huinahā nui, a 'o A^2 kona 'ili. 'O B ka lō'ihī o nā 'ao'ao o ka huinahā li'i'ili'i, a 'o B^2 kona 'ili.
2. A laila, e hana i huinakolu kūpono me ka lō'ihī o nā 'ao'ao A , B , a me C a 'o C ka lō'ihī o ka lala kūpono.
3. A laila, e 'oki i nā huinahā 'elua a e leki hou a pili a loa'a ho'okahi huinahā nui me ka 'ili C^2 .

<p>'Anu'u 1: E 'oki i nā huinahā 'elua. 'A'ole pono e 'oko'a ka nui akā, 'oi aku ka hoihoi o kēia hana inā 'oko'a.</p>	<p>'Anu'u 2: E lepili i ke 'ao'ao hema o ka huinahā nui 'o A a me ka 'ao'ao 'ākau o ka huinahā li'i'ili'i 'o B.</p>
	

<p>'Anu'u 3: E ho'ohana i ka huinahā li'ili'i e māka ai iā lalo o ka huinahā nui he <i>B</i> ka lō'ihī mai ka 'ao'ao hema.</p>	<p>'Anu'u 4: E lepili i kēia lō'ihī <i>B</i>.</p>
	
<p>'Anu'u 5: E leki i ka 'ao'ao hema o ka huinahā li'ili'i iā lalo o ka 'ao'ao 'ākau o ka huinahā nui.</p>	<p>'Anu'u 6: E lepili i ka lō'ihī ma waena o ka māka a me ka 'ao'ao 'ākau o ka huinahā li'ili'i <i>A</i>. E kūkākūkā me nā hoapapa no ka hō'ōia i ke kumu no ka lō'ihī o <i>A</i>.</p>
	
<p>'Anu'u 7: Kūpono nā ka'e <i>A</i> a me <i>B</i> ma ka 'ao'ao hema a hiki ke ho'ohana i ka lula no ke kaha 'ana i ka lala kūpono <i>C</i>.</p>	<p>'Anu'u 8: Kūpono nā ka'e <i>A</i> a me <i>B</i> ma ka 'ao'ao hema no laila, hiki ke ho'ohana 'ia ka lula no ke kaha 'ana i kekahi kūpono <i>C</i>. E kūkākūkā me nā hoapapa no ka hō'ōia i ke kumu o ka like 'o <i>C</i> me ka mea ma mua.</p>
	

<p>'Anu'u 9: I kēia manawa, e 'oki ma nā lālā kūpono a loa'a 'elua huinakolu kūpono.</p>	<p>'Anu'u 10: E ho'ohana i ka <i>translation, rotation</i>, a me ke aka aniani no ka ho'one'e i nā huinakolu a loa'a kekahi huinahā nui. Nui nā hana e hana ai no ka loa'a o kēia.</p>
	
<p>'Anu'u 11: E leki i nā 'āpana.</p>	<p>'Anu'u 12: Ua pa'a! Ua ho'omaka me 'elua huinahā me nā 'ili A^2 a me B^2.</p>
	

He aha ka 'ili o ka huinahā hope loa? He aha ka pilina o kēia 'ili me nā 'ili o nā huinahā mua?

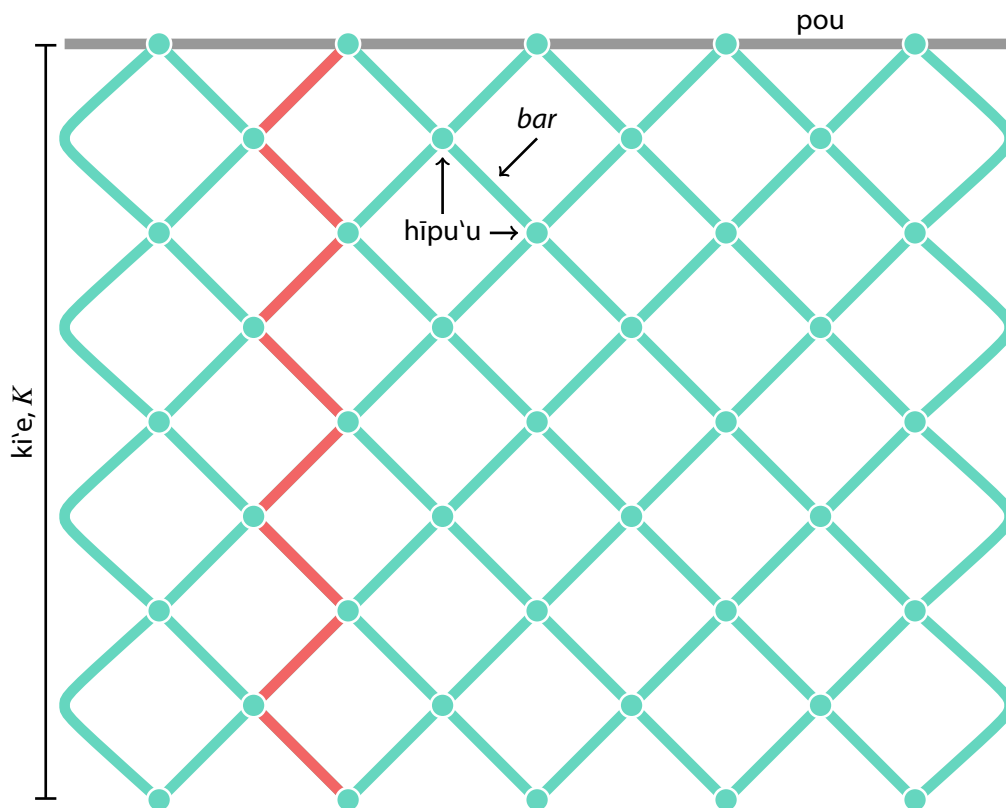
Hanana 5.2: Ka 'Upena Paekakoleo**Nā Pono Hana:**

1. Kaula
2. 'Ūpā
3. Lula
4. Pou 'ea a i 'ole he lā'au lō'ihī

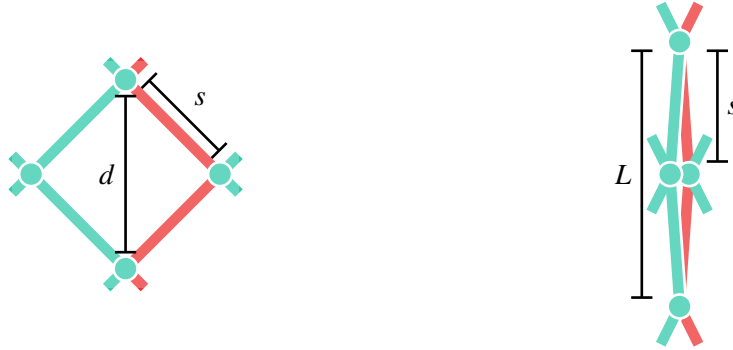
Hana:

Ke kā nei 'o Ku'ulei i 'upena. Maopopo iā ia kona makemake no ka lō'ihī o ka 'upena a me ka nui o kēlā me kēia maka*. 'A'ole 'o ia makemake e 'uha'uha i ke kaula a i 'ole e kaulike 'ole nā hīpu'u. Me kekahi hoaloha a i 'ole ma ka hui a me ka 'ike no nā huinakolu a me nā helu pu'unaue, e kōkua iā Ku'ulei ma ka ho'olālā i ka lau 'upena.

Ma ke ki'i ma lalo, kaula'i 'ia ka 'upena mai ka pou. 'Oī aku ka ma'alahi o ka humu/nāki'i i ka 'upena a pa'a. Kā 'ia ka 'upena i ia mau kaula pa'a i ka pou. Hō'ike 'ia kekahi hapa o ho'okahi kaula ma ke ki'ikuhi a 'ula'ula. He mau **hīpu'u** me nā **bars**. Like nō ka lō'ihī o nā *bars*, *s*, a 'o *K* ke ki'e o ka 'upena.



I loko nō o ka maopopo i ka lō'ihī o nā bars , hiki ke pa'akikī ka huli a loa'a ke ki'e. Ma ka māmā a hakahaka 'ana o ka 'upena, laulā a hāmama nā maka a 'o ka lala d ke ki'e o kēlā me kēia maka. Ma ka piha a kaumaha 'ana o ka 'upena i ka i'a, mālō'elo'e nā kihi o kēlā me kēia maka a pani. Ma ke pani 'ana o nā maka, kapa 'ia ke ki'e o ka maka he "eye length", L .



1. Pololei me ka 'oia'i'o nā ha'ihelu o lalo. E kūkākūkā me ka hoaaloha a e wehewehe aku.

$$\text{Ka 'Upena Māmā: } d = \sqrt{2} \times s$$

$$\text{Ka 'Upena Kaumaha: } L = 2 \times s$$

Hiki iā 'oe ke kākau i ka wehewehena ma 'ane'i inā makemake. Ho'ākāka paha ke koena o kēia hanana ma hope.

2. No laila, 'o ke ki'e o kēlā me kēia maka, 'o d ka li'ili'loa, a 'o L ka nui loa. 'O ke ki'e o ka 'upena holo'oko'a, 'o $d \times n$ ka li'ili'loa, a 'o $L \times n$ ka nui loa, ina loa'a he n maka mai ka pou a iho pololei i lalo.

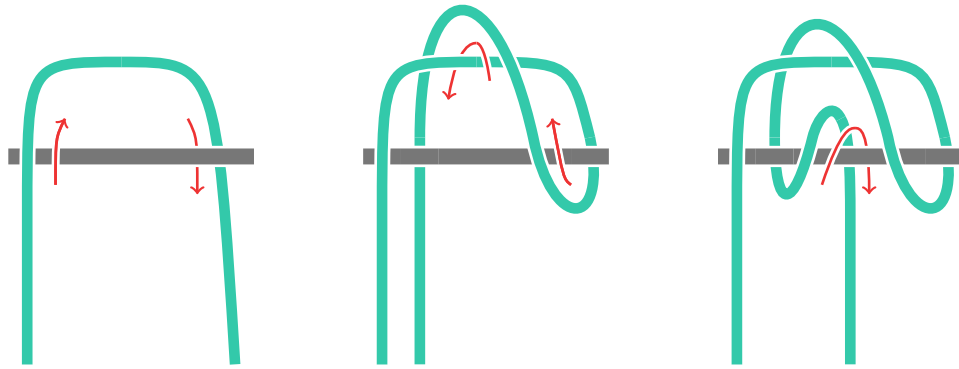
E kūkākūkā me kekahi hoapapa no ka wehewehe i ka pololei o kēia mau kaulike 'ole.

$$K \geq \sqrt{2} \times s \times n$$

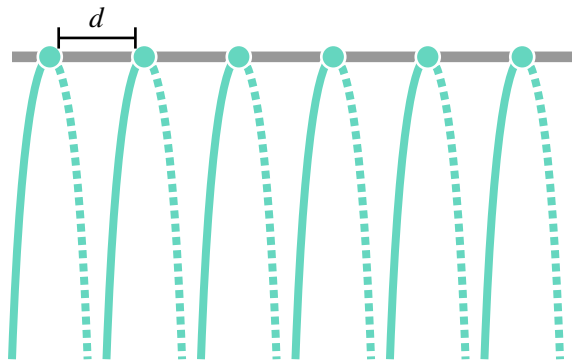
$$K \leq 2 \times s \times n$$

3. Makemake 'o Ku'ulei i 'upena he 5 kapua'i ke ki'e. Makemake pū 'o ia he 3 'īniha nā 'ao'ao o nā maka. He aha kekahi heluna maika'i o nā maka n mai luna a lalo? (He laulā nā hā'ina).

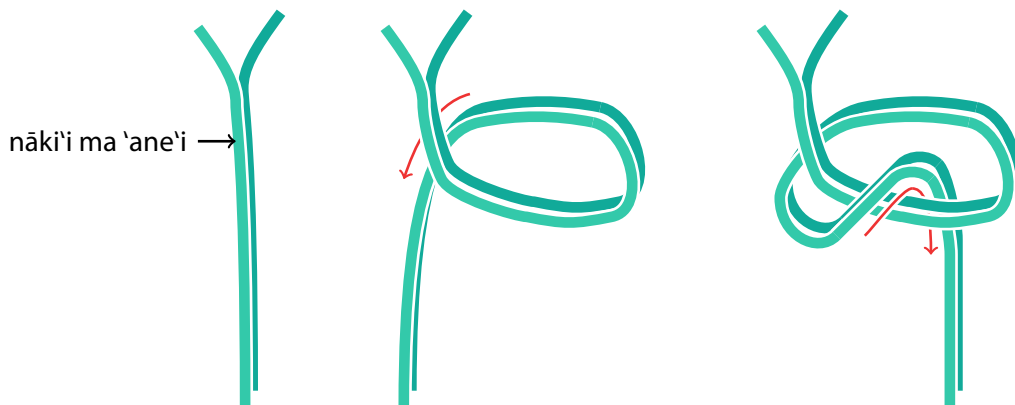
4. Ua loa'a nō iā Ku'ulei ke kōkua ma ka haku 'ana i lau no kāna 'upena, no laila, e kā kākou i kā kākou 'upena pono'ī. E ki'i aku i ka pou a i 'ole ka lā'au lō'ihī a e 'oki i kekahi mau 'āpana kaula no ka nāki'i 'ana. Nāu nō ka huli a loa'a ka lō'ihī o kēlā me kēia 'āpana. Aia a koho 'ia 'o H a me s , a laila hiki ke huli a loa'a nā mea 'ē a'e. Hō'ike ke ki'ikuhi o lalo i ka nāki'i 'ana i ke kaula i ka pou.



E nāki'i i kēia hīpu'u ma waenakonu o ke kaula a e ho'oka'awale ma ka lō'ihī d ma ka pou. 'O d ka lō'ihī o ka lala o nā maka e makemake ai.



E ho'opili i nā kaula 'elua a nāki'i kekahi me kekahi no ke kā 'upena. Penei e nāki'i ai.



E ho'omau i ka nāki'i 'ana i nā kaula he ho'okahi lālani o ka manawa. E ana me ka maiau, i ma'ema'e ka hopena. Hiki ka ana 'ia nā maka a i 'ole nā kaula; nāu ke koho.

Ke pa'a kēia hana, e wehe i nā hīpu'u mai ka pou.

