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| Umutwe w'ikina mashusho | **Ihurizo ry' ikibuga cy' indege** | |  |
| Ingingo | Ibinyampande | |  |
| Intego | Get the intuitive idea of a minimization problem, figure out how to practically implement minimization problems. | |  |
| Uburebure | 45min | |  |
| Aho ihuriro(camp) niherereye |  | |  |
| Abafashamyumvire |  | |  |
| Umubare. w'abanyeshuri |  | |  |
| Itariki |  | |  |
| Ibikoresho  nkenerwa | Pins (3 each group), string (1/group), metal ring (optional but convenient to avoid friction 1/group), thick cardboard or wooden disposable surface (1/group) | |  |
| Imyiteguro | Shyira utudomo dutatu kugiti | |  |
|  | | | |
| **Igihe cy'ikinamashusho** | **Ibyo umufashamyumvire akora** | **Ibyo abanyeshuri bakora** | |
| 00:00 - 00:26 | Intangiriro rusange y'ikinamashusho ya VMC | |  |
| 00:27 - 00:40 | Intangiriro y' ikinamashusho | |  |
| 00:41 – 01:30 | Riddle | |  |
| 00:41 – 01:30 | Intangiriro y' igerageza ryambere | |  |
| Ihagarikamashusho Gushaka igisubizo | * Assist the process, provoke thoughts | * Try to find a setting of the string such that the minimization of the length of the string corresponds to minimize the sum of the lengths of the roads | |
| 01:31 - 2:12 | Igisubizo | |  |
| VIDEO PAUSE Geometry | * Assist the process, provoke thoughts | * Try to figure out what geometrical property the new point has in relation to the starting 3. | |
| 2:13 – 2:48 | Kugaragaza dogere 120 | |  |

**igisubizo**

The point ,F, found as shown in the video, is called Fermat Point.

There are several different possible paths of the string that can be used to find point F.

Notice that the use of the ring is not strictly necessary, but it helps to reduce friction (natural enemy of this experience).

Once the point is found (before watching the solution in the video) students can be asked to find the angles by noticing that each angle is congruent and they form 360° all together.

A geometrical construction that can be used to find F consists in building equilateral triangles on the sides of the original triangle and connecting opposite points:

This construction can be replicated on the wooden board to verify that the two methods will lead to the same point.