

Maestro Summer Program, Summer 2016
Math Worksheet #2, 19 July 2016

Name: _____

Remember, what we care about is the *reasoning*, **not the final answer!** Explain all your work!

1. If you are a CSU-Pueblo student, your cost might be the cost of room and board, plus a cost which depends upon how many credits you take. The cost of a shared room in Creston, Culebra and Greehorn is \$2,830, while a typical meal plan is \$1,913. The cost per credit hour is given in the following table.

Credit Hours	Base Tuition (Student share + COF)	Less COF Stipend	Student's Share of Base Tuition	Student Facility Fee	Student Athletic Fee	Student Affairs Fee	Student Recreation Center Operations Fee	Technology Fee	Student Health Fee	Student Center Fee	Child Care Center - Discount Program	Student's Share of Base Tuition & Fees
1	317.29	(75.00)	242.29	23.00	12.65	11.25	9.95	7.25	8.00	2.50	0.40	317.29
2	634.58	(150.00)	484.58	46.00	25.30	22.50	19.90	14.50	16.00	5.00	0.80	634.58
3	951.87	(225.00)	726.87	69.00	37.95	33.75	29.85	21.75	24.00	7.50	1.20	951.87
4	1269.16	(300.00)	969.16	92.00	50.60	45.00	39.80	29.00	32.00	10.00	1.60	1,269.16
5	1586.45	(375.00)	1211.45	115.00	63.25	56.25	49.75	36.25	40.00	12.50	2.00	1,586.45
6	1903.74	(450.00)	1453.74	138.00	75.90	67.50	59.70	43.50	48.00	15.00	2.40	1,903.74
7	2221.03	(525.00)	1696.03	161.00	88.55	78.75	69.65	50.75	56.00	17.50	2.80	2,221.03
8	2538.32	(600.00)	1938.32	184.00	101.20	90.00	79.60	58.00	64.00	20.00	3.20	2,538.32
9	2855.61	(675.00)	2180.61	207.00	113.85	101.25	89.55	65.25	72.00	22.50	3.60	2,855.61
10	3172.90	(750.00)	2422.90	230.00	126.50	112.50	99.50	72.50	80.00	25.00	4.00	3,172.90
11	3490.19	(825.00)	2665.19	253.00	139.15	123.75	109.45	79.75	88.00	27.50	4.40	3,490.19
12	3807.48	(900.00)	2907.48	276.00	151.80	135.00	119.40	87.00	96.00	30.00	4.80	3,807.48
13	4124.77	(975.00)	3149.77	299.00	164.45	146.25	129.35	94.25	104.00	32.50	5.20	4,124.77
14	4442.06	(1050.00)	3392.06	322.00	177.10	157.50	139.30	101.50	112.00	35.00	5.60	4,442.06
15	4759.35	(1125.00)	3634.35	345.00	189.75	168.75	149.25	108.75	120.00	37.50	6.00	4,759.35
16	5076.64	(1200.00)	3876.64	368.00	202.40	180.00	159.20	116.00	128.00	40.00	6.40	5,076.64
17	5393.93	(1275.00)	4118.93	391.00	215.05	191.25	169.15	123.25	136.00	42.50	6.80	5,393.93
18	5711.22	(1350.00)	4361.22	414.00	227.70	202.50	179.10	130.50	144.00	45.00	7.20	5,711.22
19	5786.22	(1425.00)	4361.22	437.00	240.35	213.75	189.05	137.75	152.00	47.50	7.60	5,786.22
20	5861.22	(1500.00)	4361.22	460.00	253.00	225.00	199.00	145.00	160.00	50.00	8.00	5,861.22
21	5936.22	(1575.00)	4361.22	483.00	265.65	236.25	208.95	152.25	168.00	52.50	8.40	5,936.22
22	6011.22	(1650.00)	4361.22	506.00	278.30	247.50	218.90	159.50	176.00	55.00	8.80	6,011.22
23	6086.22	(1725.00)	4361.22	529.00	290.95	258.75	228.85	166.75	184.00	57.50	9.20	6,086.22

Suppose you label some Cartesian coordinates with x being the number of credits hours a student takes, and y is the cost of being a CSU-Pueblo with that course load.

Question: is the relationship **linear**; *i.e.*, is the graph a line? If so, write down its equation. If not, explain why not.

2. Every object with some aerodynamics that falls through the air has a *glide ratio*: the glide ratio of $a : b$ means the object moves a units of distance horizontally as it loses b units of height.

An experienced user of a modern hang glider can get a glide ratio of $17 : 1$ while an experienced paraglider gets a glide ratio of $9 : 1$.

Suppose two experts jump off of the same $200m$ cliff, over a level plane, one in a hang glider, the other using a parasail. How much farther can the hang glider get than the paraglider?

Hint: One way to do this is to set up a coordinate system – explain what are x and y , what units you are using, which direction they increase, where is the origin, *etc.* – and write an equation of the line of travel for each glider. Then you can see where they hit the plane, and see how far apart are the two landing spots.