Student Name:

							Total
Criteria 1	0	8	16	24	32	40	
Criteria 2	0	8	16	24	32	40	
Criteria 3 & 4	0	4	8	12	16	20	

Mathematics Secondary 3

Situational Problem – Summer Olympic Medals

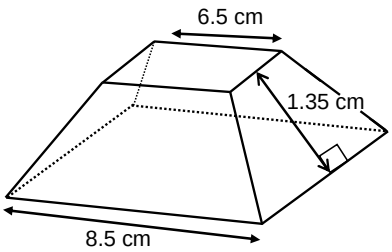
The next Summer Olympics are this August in London, England.
You are the assistant to the purchasing director of the Olympic Committee.

- You must calculate the exact cost of purchasing all the medals (gold, silver, and bronze) for the events in the categories listed in the table on page 2.
- You have been assigned a budget of $1 100 000.
- One gold, one silver, and one bronze medal are awarded at **each** event. There are no ties.

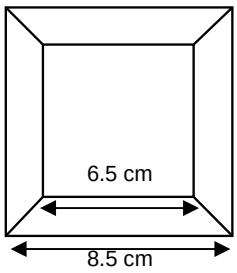
GOLD MEDALS

The solid chosen for the gold medals is a square-based right pyramid whose dimensions are provided below.

Three-dimensional (3-D) view



Top view

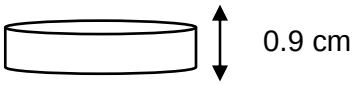


Because gold is very expensive, the medals will be made of another material and then coated in gold on all sides. The cost of the gold is $0.55/mm^2.

SILVER MEDALS

The silver medals are made entirely of silver, and the bronze medals are made entirely out of bronze. Both medals are in the shape of a cylinder. Diagrams are not to scale.

- Thickness of the medal: 0.9 cm
- Lateral area of the cylinder is 16.96 cm^2



- The cost of the silver is $12 / mL.
- Bronze medals is a mixture of copper and tin; the cost to make the bronze medal is $10.10 per cm^3.

The following table provides some information about the number of events in the top four categories.

Categories	Events in each Category
Athletics	47
Aquatic	(x+4)(x+5) +4
Equestrian	3x(4x – 5)
Gymnastic	$\frac{(3^4 \cdot 2^3)^2}{3^6 \cdot 2^4}$
Total	$13x^2 + 32x + 1$

How much money is needed for each medal?

Can you buy all of the medals with your given budget?

Your solution:

Your solution: