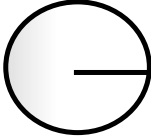**World 6-1 Calculating Surface Area**

1) Write down the appropriate equations for **area** under each shape.

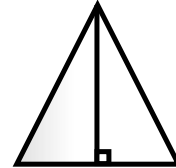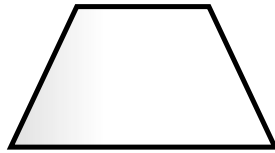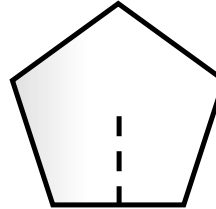CIRCLE   SQUARE   RECTANGLE   TRIANGLE

TRAPEZOID   REGULAR POLYGON

2) Calculate the area of the following. Make sure to show the formula, and all steps. Don't forget units!

     a) a circle with diameter 60 cm   b) a square with side length
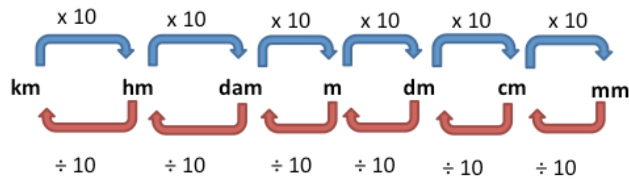   5.7mm

     c) a triangle with a base of 4 cm and a height of 6.2cm

     d) a trapezoid with bases of 15 dm, and 21 dm, and
        a height of 4 dm
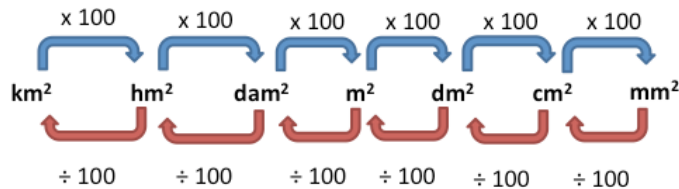
World 6-2 Unit Conversions

Units of Length

1) Convert the Units of Length

a) 53 m = _____ cm

b) 9 m = _____ mm

c) 88 cm = _____ mm

d) 30 dm = _____ dam

e) 88 dam = _____ km

f) 18 km = _____ dm

g) 490 hm = _____ cm

h) 560 cm = _____ km

i) 10 km = _____ m

j) 345 mm = _____ dam]]

Units of Area

2) Converting Units of Area

a) $32\ m^2$ = _____ cm^2

b) $15\ m^2$ = _____ m^2

c) $0.003\ km^2$ = _____ mm^2

d) $0.03\ km^2$ = _____ dam^2

e) $9\ dam^2$ = _____ hm^2

f) $0.04\ dm^2$ = _____ mm^2

g) $53\ m^2$ = _____ cm^2

h) $5.5\ m^2$ = _____ dam^2

i) $590\ 000\ mm^2$ = _____ km^2

j) $0.3\ dam^2$ = _____ dm^2

All Dimensions of Space Unit Conversions

Convert the following measurements into a new set of units.
SHOW ALL OF YOUR WORK

Length
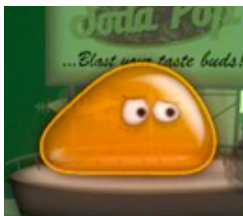a) 1.6 km into mm   b) 70 dm into hm

Area
c) 5 m^2 into mm^2 d) 42 hm^2 into cm^2

Volume
e) 0.4 m^3 into cm^3 f) 5000 mm^3 into dm^3

Bonus: A *blob* finds itself in the 4th dimension! If in this dimension, the volume of the blob is 4 m^4 how many quadric centemetres would this be? (Ie cm^4)

Solid	Lateral Surface Area	Area of the Base	Total Area
Cube			
Prism			
Cylinder			
Cone			
Pyramid			
Sphere			

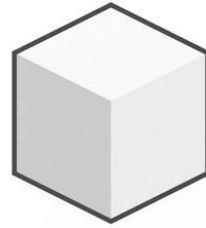**World 6-3 Surface Area of Cubes, Prisms and Cylinders**

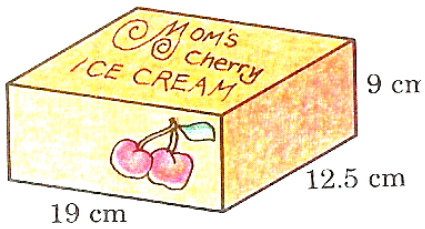1) Determine the surface of these cubes in their respective units.
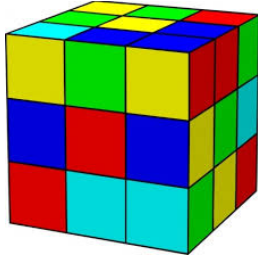
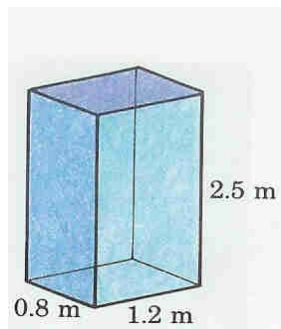**Side length:** 5.7 cm   **Side length:** 1.6 cm   **Side length:** 32 mm

2) Calculate the surface area of these prisms

a)

9 cm

12.5 cm

19 cm

b)

2.5 m

0.8 m   1.2 m

c)

10 cm

5 cm

8 cm
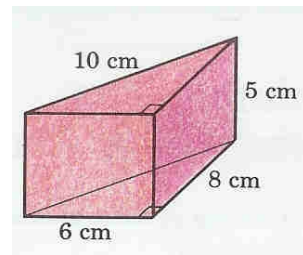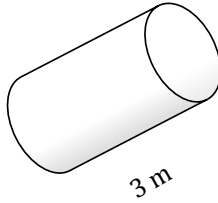
6 cm

3) Determine the surface of these cylinders in their respective units.

a)

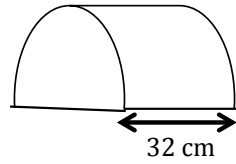b)

c)

3 m
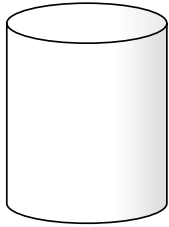
32 cm

Height 12 dm
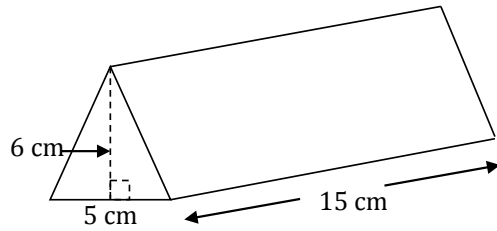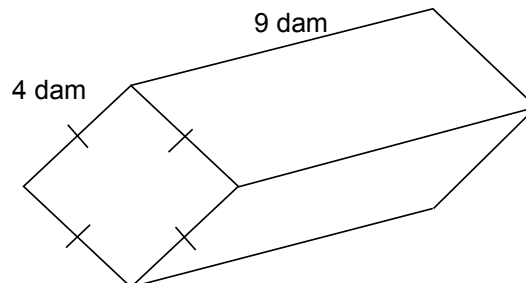**Radius:** 2.5 dm

Diameter 0.8 m

Height: 32 cm
Radius: 12 cm

4) a) Calculate surface area in cm^2
    b) Calculate surface area in hm^2

6 cm

5 cm

15 cm
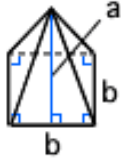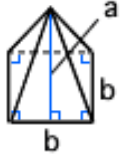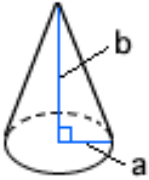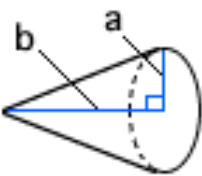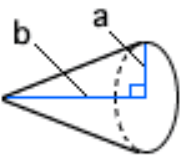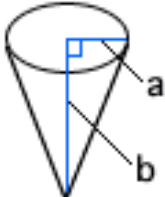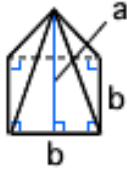
5. a) Calculate surface area in dam^2
    b) Calculate surface area in cm^2

9 dam

4 dam
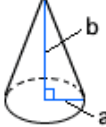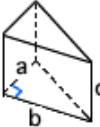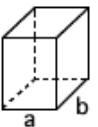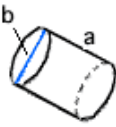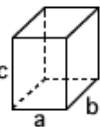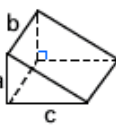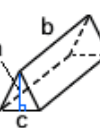
World 6-4 Surface Area of Cones, Pyramids, and Spheres

Find the <u>total surface area</u> of each solid.

1)	2)	3)
a = 10 mm b = 14 mm	a = 5.1 m b = 17 m c = 17 m	a = 3.9 cm b = 15.8 cm

4)	5)	6)
a = 3.4 mm b = 8 mm	a = 4 m b = 9 m	a = 2 mm b = 11.7 mm

7)	8)	9)
a = 10 mm	a = 6 cm	a = 16 in b = 6 in

World 6-5 More Surface Area Practice

1) a = 8 cm b = 56 cm	2) a = 6 m b = 8 m	3) a = 5.55 m b = 9 m c = 11 m
) a = 40m b = 35m c = 67m	5) a = 1 cm b = 21 cm	6) a = 6.3 km b = 10 km c = 33 km
7) a = 6 cm b = 16 cm	8) a = 8.55 km b = 5 km c = 11 km	9) a = 6.55 m b = 11 m c = 11 m

Additional Practice

a)   Give the surface area
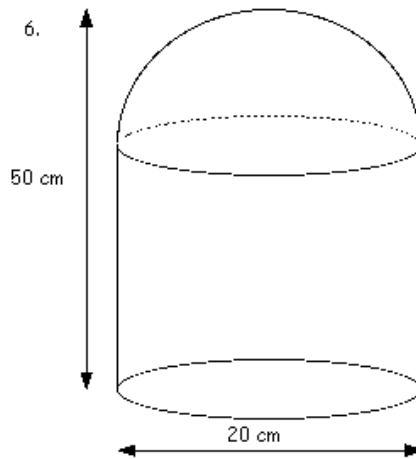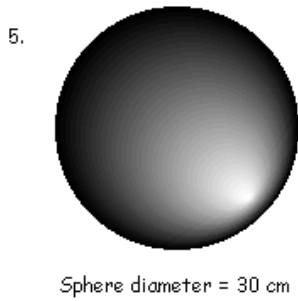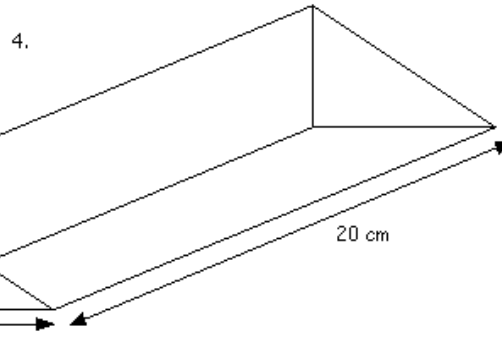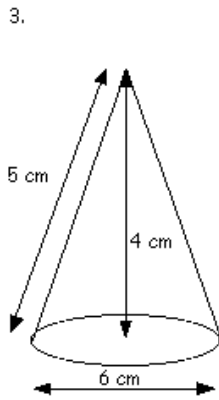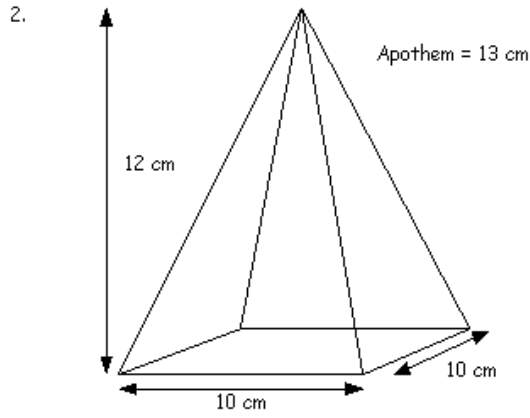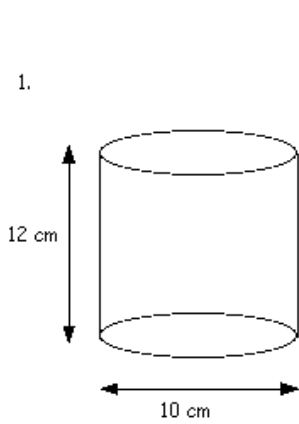
2.

1.

12 cm

Apothem = 13 cm

12 cm

10 cm

10 cm

3.

4.

5 cm

4 cm

6 cm

20 cm

6 cm

8 cm

6.

5.

Sphere diameter = 30 cm

50 cm

20 cm

World 6-6 Surface Area of Decomposable Solids

1) a) Calculate the total surface area
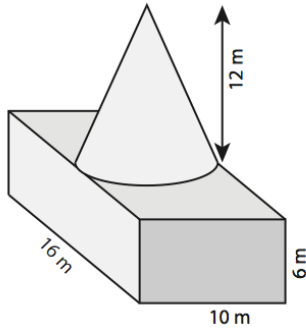
12 m

16 m

6 m

10 m

b) Calculate the total surface area
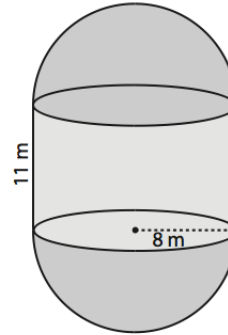
11 m

8 m

2) The *amber gem* is a very valuable jewel (multi-million $). The value of the gem is $100/mm^2. What is the value of *amber gem*?

21 cm

16 cm

4 cm

Apothem 6 cm
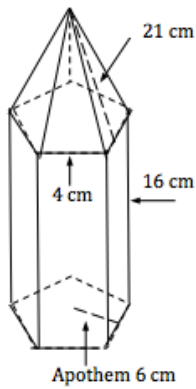
3) What is the total surface area of this shape?

15 cm

9 cm

25 cm
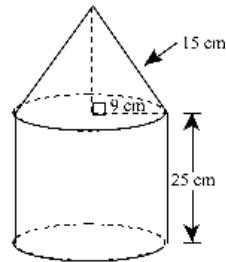
4) How much fabric was used to cover the lateral surface of the tent?

2.34 m

1.12 m

1.15 m
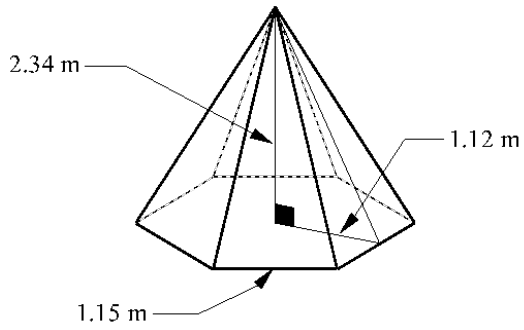
5) What is the total surface area of the birdhouse with a hole cut out on one face?

18.03 cm

6 cm

30 cm

20 cm   20 cm
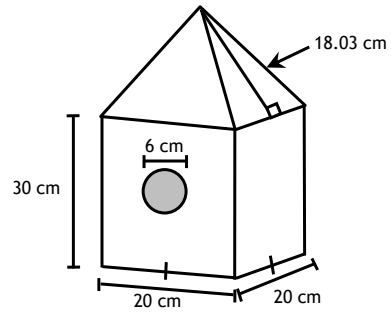
e)

6) a) Calculate the surface area of this cone

22 cm

21 cm
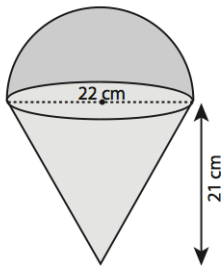
b) Calculate the surface area of this podium

4 mm

4 mm

3 mm

16 mm

10 mm

MINI SITUATIONAL PROBLEM #7:
VALENTINE'S DAY DATE
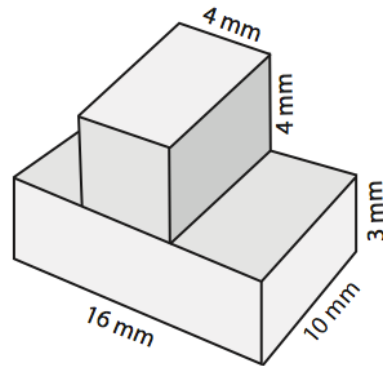
	Criteria 1						Total
Criteria 1	0	8	16	24	32	40	
Criteria 2	0	8	16	24	32	40	
Criteria 3 & 4	0	4	8	12	16	20	

Mike and Cindy are planning a Valentine's Day date.

1-Chocolates of Love

Mike is purchasing chocolates for Cindy at the last minute. He's hoping she will be the "one." However, Mike is very 'cheap.' He doesn't like spending money on chocolates, but he will buy 1 box of chocolates.

As he walks into the store he sees 3 different boxes of chocolates to choose from.

Ferrero Rocher   **Pot of Gold**   **Toblerone**

10 cm

SL=13 cm

2.4 cm

2x-4

3x cm

5 cm

6 cm

24.3 cm

5 cm
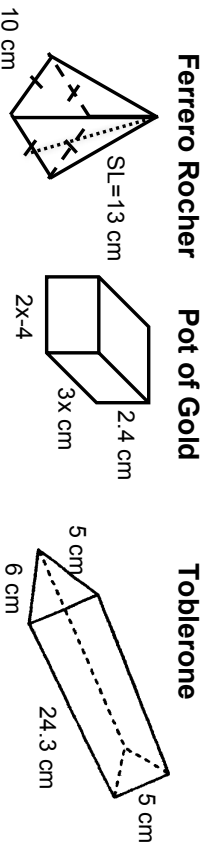
Ferrero Rocher contains spherical chocolate candies that fill the volume inside the pyramid.

Each candy has a radius of 2 cm and costs $0.50.

Mike notices that the surface area of Pot of Gold and Toblerone are the <u>same</u>.

The Toblerone is also on sale at $5.65 a box.
The Pot of Gold box costs $0.015625/cm³

2-Red Roses or White Roses?

As Mike passes the flower display, he remembers he should pick up some roses and a card. The white roses are $1.65 per rose and $4.50 for a card. The cost of red roses is displayed on the wall and includes the cost of a card. He's going with the less expensive option, and would like 15 roses.

Red Roses and a Card Deal

# of Red Roses	Cost ($)
6	14
12	24.50
20	38.50

3-Cinnamon Heart Treasure Hunt

Cindy is trying to impress Mike. She knows that Mike likes cinnamon heart candies and so she surprises him with a treasure hunt. She's put candies is several locations.

Location	# of Cinnamon Hearts
Lunch Box	x
Locker	$\dfrac{16\left(x^3 \cdot x^2\right)^7 \, x^{-30}}{2^4 \, x^3}$
Backpack	$(x-3)(x+7)$
Friend Delivery	$3^3 + (20x)^0 - 5x$

Along with the delivery, she sends a note:
"Darling meet me at the Joe's Milkshakes tonight. The time we will meet is represented by the # of hearts you got in your lunch box." There are 105 cinnamon hearts in all.

Love Cindy

1. How much does the chosen box of chocolates cost?
2. How much do the 15 roses Mike chose cost?
3. What time is their date at Joe's Milkshakes?

Practice Test #4:
Surface Area and Conversions

Name: _____   Date: _____

Teacher Comments

PART A: Multiple Choice *write the correct letter in the space provided (2 marks each)*

1) What is the area of a hexagon with apothem of 5 cm and side lengths 9 cm?

a) 112.5 cm^2 b) 225 cm^2 c) 270 cm^2 d) 135 cm^2

2) The length of a snowboard is 2 m how many mm is this?

a)   200 000 mm   b) 0.002 mm   c) 2000 mm   d) 200 mm

3) Below is a view of 8 concentric cubes in axonometric perspective.
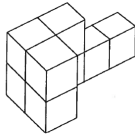
Which of the following shows the top view?

a)   b)

c)   d)
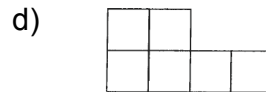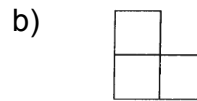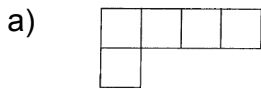
4) Convert 40 hm^2 into dm^2

a) 40 dm^2 b) 40 000 000 dm^2 c) 4 000 000 dm^2 d) 0.04 dm^2

5) Jason plans to give his friend a Christmas gift. The dimensions of the gift box are indicated on the figure below. Before he goes out to buy gift-wrap, he has to calculate the total area of the box.

Which expression can be used to calculate the total area of the box?

A) $c(2a + 2b)$

B) $2b(a + 2c)$

C) $ab + ac + bc$

D) $2ab + 2ac + 2bc$
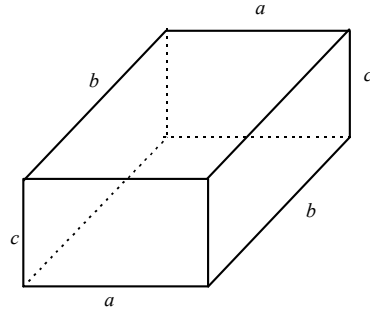
PART B: Short Answer *write the correct letter in the space provided*

---

1) A sphere has a radius of 12 m. Determine the surface area (3 marks)

2) What is the surface area of a Rubik's cube with side length 8 cm? (3 marks)

3) A cone has a height of 12 cm and a radius of 9 cm. What is the total surface area? (4 marks)

1. Mmmmm…. TOBLERONE

Toblerone is considering changing its packaging to reduce costs. If they change their package from Design B to Design A are they making a good choice? (include the area of the bases).

Design A   Design B

21 cm

12 cm

5 cm

4 cm
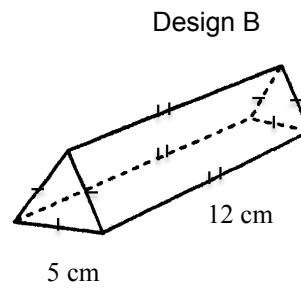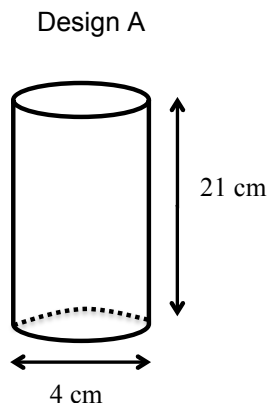
Is Toblerone making a good choice? Explain

_____

_____

	Uses mathematical reasoning					
		Observable indicators correspond to level				
	LEVEL	A	B	C	D	E	
Evaluation Criteria	Cr. 3	40	32	24	16	8	0
	Cr. 2	40	32	24	16	8	0
	Cr. 4 Cr. 5	20	16	12	8	4	0

105

2. THE AMBER GEM

The *amber gem* is a very valuable jewel (multi-million $). The value of the gem is $100/mm^2. What is the value of *amber gem*? SHOW YOUR WORK.

21 cm

4 cm   16 cm

Apothem 6 cm
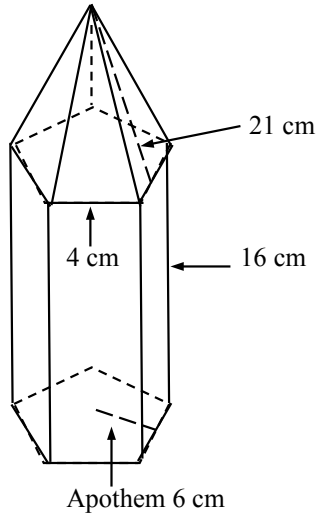
The cost of the amber gem is $ _____.

	LEVEL	A	B	C	D	E	
			Uses mathematical reasoning				
				Observable indicators correspond to level			
Evaluation Criteria	LEVEL	A	B	C	D	E	
	Cr. 3	40	32	24	16	8	0
	Cr. 2	40	32	24	16	8	0
	Cr. 4 Cr. 5	20	16	12	8	4	0

3. PAINTING THE GAZEBO

A gazebo in the shape of a hexagonal based prism with a hexagonal based pyramid as the roof. Students have been hired to paint the walls and the roof of the gazebo. They do not need to paint the door or the floor of the structure.

Each wall is 8 m long, the walls are 3 m high and the slant lengths of the roof are 8.5 m long. The door has an area of 6 m². **Calculate the cost of painting the gazebo if it costs $5/m² to paint.**
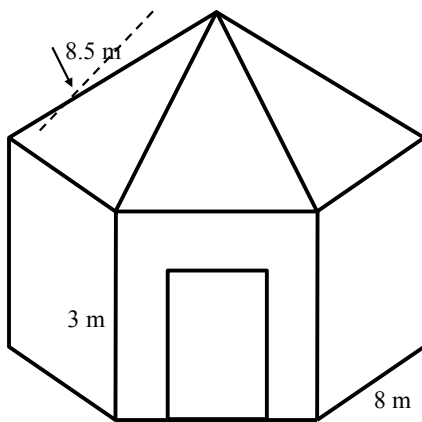
The cost of painting the gazebo is $ _____.

Uses mathematical reasoning						
	Observable indicators correspond to level					
LEVEL	A	B	C	D	E	
Cr. 3	40	32	24	16	8	0
Cr. 2	40	32	24	16	8	0
Cr. 4 Cr. 5	20	16	12	8	4	0

Evaluation Criteria