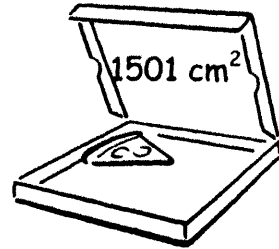


Grade 8 Final Exam Review

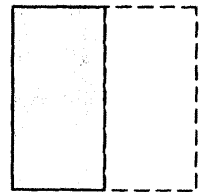
APPLICATIONS AND PROBLEM SOLVING

UNIT 1: Square Roots and The Pythagorean Theorem

1. A pizza box has a square top. The area of the top is 1501 cm^2 . Calculate the length of the side of the box to a tenth of a centimetre.

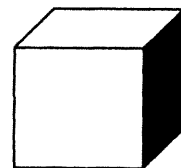


2. This rectangle is half of a square. If the square has an area of 10.24 cm^2 , what are the side lengths of the rectangle?

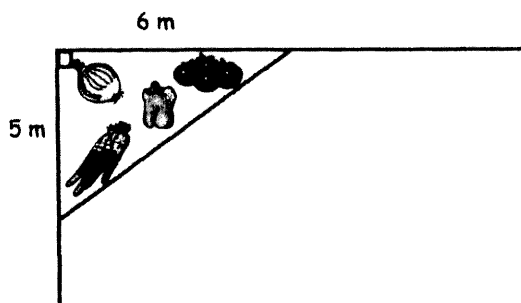


3. A mall has an area of 5632 m^2 . It is divided into 22 equal square shaped stores. What are the dimensions of each store?

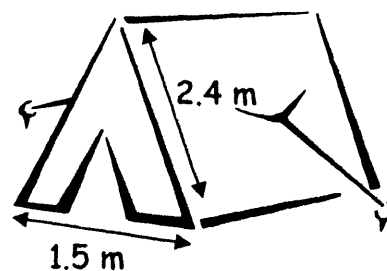
4. A cube has a surface area of 384 cm^2 . What are the dimensions of the cube?



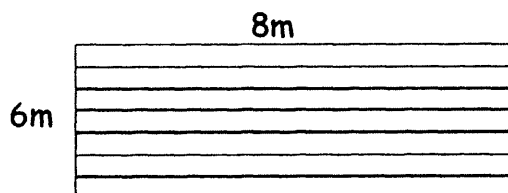
5. Farmer Joe wants to make a vegetable garden in the corner of his yard, but has a terrible rabbit problem. He decides to surround his garden with chicken wire in hopes of preventing the rabbits from eating all of his vegetables. How much chicken wire does Farmer Joe need in order to enclose his vegetable garden?



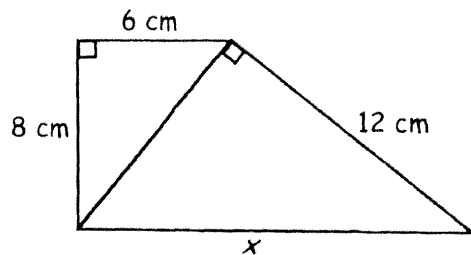
6. The Outdoor Ed class is going camping for Lifeweek and Mr. Filewich is joining the group. The tent available for Mr. Filewich has the dimensions shown in the picture below. If Mr. Filewich is 2.08 m tall, will he be able to stand up straight in the tent? Explain.



7. A carpenter is building a 6 m by 8 m rectangular deck. Without using a carpenter's square or angle measurement, how can the carpenter verify that the rectangle has square corners?



8. What is the length of x to the nearest tenth of a centimeter?



UNIT 2: Integers

1. Evaluate.

a) $(-6) \times (+2) \times (-4) =$

b) $(-1) \times (-1) \times (-1) =$

c) $(-64) \div (+2) \div (-4) =$

d) $(+25) \div (-5) \times (-2) =$

2. Use these integers $\{0, -2, +3, -1, +1, -3, +5\}$ to answer the following questions:

a) Which two sets of integers have a quotient of -3 ?

b) Which two integers have the greatest product?

c) Which three integers have the greatest product?

d) Which two integers have the least sum?

e) Which two integers have a quotient less than -3 ?

3. A student answered this question:

Explain the error made by the student and show how to correctly answer this question.

$$\frac{[(-9) - (+2)] \times 8 + (-4)}{(-12) \div (+6)}$$

$$= \frac{(-11) \times 4}{-2}$$

$$= \frac{-44}{-2}$$

$$= 22$$

4. Use only these integers: -9, -5, -2, 1, 3 to replace each * in the expression below to get a value of (-24). Each integer can only be used once.

$$(*) (*) + (*) \div (*) - (*) = -24$$

5. Complete each with the correct operation (+, -, ×, ÷) to make each equation true.

a) $(-3) \square (+5) \square (+1) = -14$

b) $(-5) \square (-2) \square (+4) = 1$

c) $(-4) \square (-24) \square (-6) = 0$

UNIT 3: Operations with Fractions

1. For dessert, Joni's family ate $\frac{1}{3}$ of a blue berry pie and some apple pie. If they ate $1\frac{1}{12}$ pies in all, what fraction of the apple pie did they eat?
2. Two-thirds of the school yard was covered in grass. The parent council planned to replace one-quarter of the grass with a baseball diamond. How much of the school yard will the school yard will the baseball diamond occupy?
3. Ken typed one-third of his story on the computer in 30 minutes. How many hours did it take him to complete the whole story?

4. Explain the error made by this student and demonstrate how to find the correct answer.

$$\begin{aligned} & 5\frac{2}{8} \times \frac{10}{5} \\ &= \frac{18}{8} \times \frac{10}{5} \\ &= \frac{180}{40} \\ &= 4\frac{1}{2} \end{aligned}$$

5. Mr. Simpson's gas tank was seven-eighths full when he left home. He used three-fourths of a tank of gas on his errands. What fraction of the tank of gas was left? Show how you got your answer.
6. Elena spends half of her money buying a ticket at the school dance. From one-third of the money she has left, she buys herself a piece of pizza and a soft drink. When she gets home, she has \$4.50. How much money did Elena have when she went to the dance?

7. Explain the error made by this student and demonstrate how to find the correct answer.

$$\begin{aligned} & 2\frac{7}{8} \div 1\frac{2}{3} \\ &= 2\frac{7}{8} \times 1\frac{3}{2} \\ &= \frac{23}{8} \times \frac{5}{2} \\ &= \frac{115}{16} \\ &= 7\frac{3}{16} \end{aligned}$$

8. Write three multiplication statements that have a product of $\frac{3}{4}$.

9. Complete each statement with the fraction that makes each statement true.

$$\text{a) } \frac{3}{8} \times \boxed{} = \frac{3}{32}$$

$$\text{b) } \frac{4}{9} \div \boxed{} = \frac{32}{63}$$

$$\text{c) } \boxed{} \times 1\frac{2}{3} = \frac{8}{3}$$

$$\text{d) } \boxed{} \div \frac{7}{4} = 1\frac{5}{21}$$

10. Write each result in simplest terms.

a) $16 \times \frac{3}{5} - \frac{8}{9}$

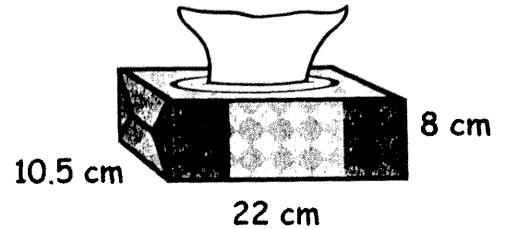
b) $3\frac{2}{5} \times \left(2\frac{1}{2} + 2\frac{1}{4}\right)$

c) $8\frac{1}{3} - \frac{8}{3} \div \frac{1}{2}$

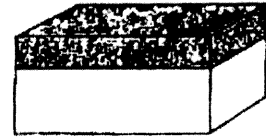
d) $\frac{4}{5} \div \frac{5}{4} \times \frac{4}{5} \div \frac{5}{4}$

UNIT 4: Measuring Prisms and Cylinders

1. A box of facial tissues is 22 cm by 10.5 cm by 8 cm. How much cardboard is on the outside surface?



2. A storage box is 60 cm long, 45 cm wide and 30 cm high. The lid is 10 cm high. What is the surface area of the box and its lid?



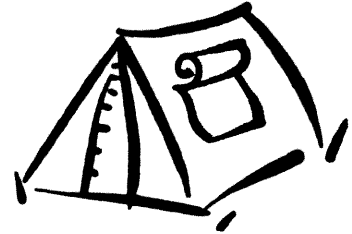
3. The height of a paint can is 12.5 cm. The diameter of the base is 10.5 cm.

- a) What is the surface area of the can, including the lid?

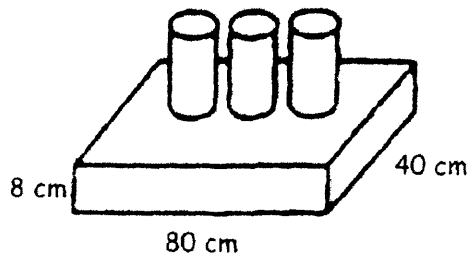


- b) How much will it cost the manufacturer to make the can and lid if metal costs 0.02¢ for each square centimeter?

4. The open ends of a pup tent are isosceles triangles with a base of 1.5 m and a height of 1 m. The length of the tent is 2 m. How much material do you need to construct the tent?

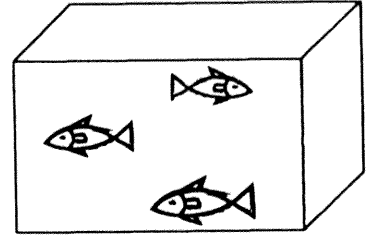


5. Maria builds a ring toss game during woods class. She stains all the exposed surfaces. How much surface area does she cover with the stain?



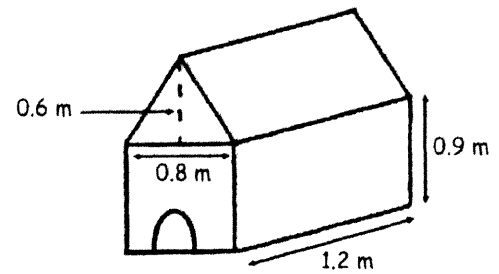
Cylinder height = 20 cm
Circle diameter = 10 cm

6. a) An aquarium is filled to 3 cm from the top. How much water is in the aquarium if it is 75 cm long, 42 cm wide, and 48 cm high?

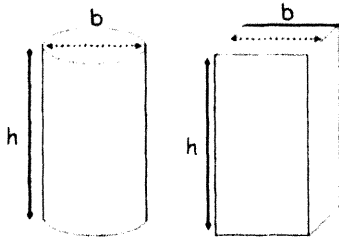


- b) What is the total volume of the aquarium?

7. What is the volume of this doghouse?



8. Two solids have the same height and base width. One is a cylinder and the other is a square-based prism. Which holds more? Why?



9. Penny buys milk in 2 L jugs for a daycare. The glasses are cylinders 6 cm in diameter and 10 cm tall. Each glass is to be filled to within 1 cm of the top of the glass. How many jugs of milk must Penny buy to fill 65 glasses?

UNIT 5: Percent, Ratio and Rate

1. At birth, Canadians have a life expectancy of about 77 years. A beaver has a life expectancy of about 5 years. What percent of a human's life expectancy is a beaver's life expectancy?

2. During a real estate boom, the price of a house rose from \$200 000 to \$585 000 over ten years. What percent of the original price is represented by the increase in value?

3. In 1966, a new car cost \$4000. In 1996, a similar sized car cost \$26 000. Express the increase in price over the 30 years as a percentage.

4. The cost of an iPad is \$519.00. It is on sale until July 15th for 27% off the regular price. Calculate the cost of the iPad with the discount and PST and GST.

5. Brooke answered this question on a test:

*A sweater originally priced at \$60 was on sale for \$45.
What was the percent decrease for the sweater?*

Brooke solved the problem and her answer is shown below:

$$60 - 45 = 15$$

$$\frac{15}{45} = 0.33 \quad \text{The sweater was on sale for 33% off the regular price.}$$

Is Brooke correct? Explain how you know. If she is not correct, show how to correctly solve this problem.

6. In the recent Science Olympics, there were 20 questions for competitors to answer. For every correct answer, students received 1.25 marks, and for every incorrect answer, they lost 0.5 marks.

a) Calculate the percent scores for these teams.

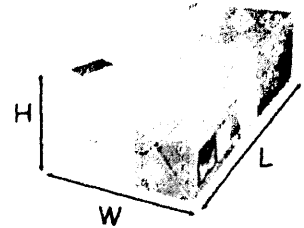
| Teams | Da' Atom Bomb | The Dissectors | Viscose Villians | Sheldon Cooper |
|------------------------|---------------|----------------|------------------|----------------|
| # of correct questions | 15 correct | 10 correct | 12 correct | 20 correct |

b) Is a score of 125% possible? Explain.

7. At Jack Frost's Ice Cream Parlour, the ratio of vanilla to chocolate to strawberry ice cream cones sold is about 3 : 5 : 4. One week, customers bought 250 chocolate cones. How many vanilla and strawberry cones were sold?

8. The ratio of length to width to height of a box is 4 : 1 : 2.

a) If the height of the box is 25 cm, what are the other dimensions?



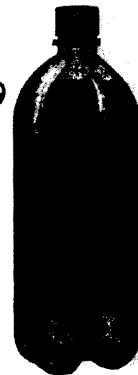
b) What is the volume of the box?

9. Which is the best buy? Show how you know.

12 cans of Pepsi for \$3.99

or

One bottle of Pepsi for \$1.79



UNIT 6: Linear Equations and Graphing

1. Make a table of values for the relation $y = 2x - 7$ for integer values of x from -3 to 3.

| | | | | | | | |
|-----|--|--|--|--|--|--|--|
| x | | | | | | | |
| y | | | | | | | |

- a) What is the value of y when $x = 7$?
- b) What is the value of x when $y = 7$?
- c) Estimate the value of y when $x = 1.5$?

2. Make a table of values for the relations $y = x + 3$ and $y = 2x - 4$.

For what value of x will the relations have the same y -value?

3. The equation of a linear relation is: $y = -3x + 8$.

Which ordered pairs are NOT in the relation? Show how you know.

A(3, -1), B(7, -13), C(8, -16), D(9, -20)

4. The price of a medium pizza is \$15, plus \$3 for each topping.

An equation for this relation is: $c = 15 + 3t$, where t represents the number of toppings and c represents the cost of the pizza in dollars.

- a) Complete this table of values for the relation.

| | | | | | |
|-------------------------|---|---|---|---|---|
| Number of Toppings, t | 0 | 2 | 4 | 6 | 8 |
| Cost, c (\$) | | | | | |

- b) What is the cost of a pizza with 7 toppings?

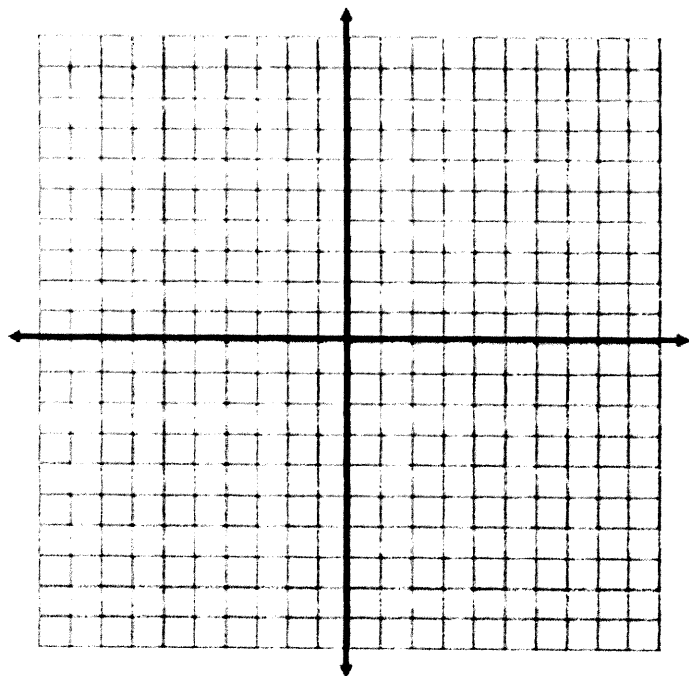
5. a) Graph each relation for integer values of x from -3 to 3.

i) $y = x + 3$

ii) $y = 2x - 1$

iii) $y = -3x + 1$

iv) $y = -x - 4$



b) Which graphs go up to the right? Which graphs go down to the right?

c) How can you use the equation of a linear relation to tell if its graph goes up or goes down to the right?

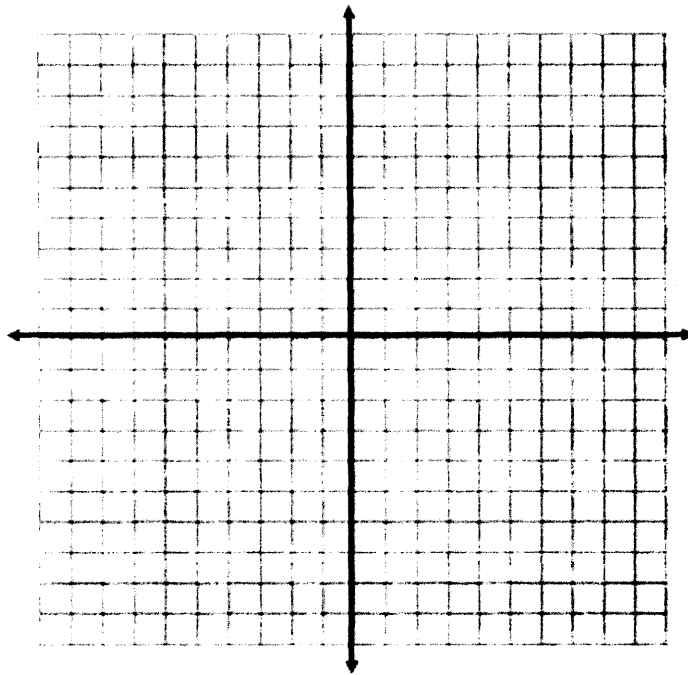
6. Bernadette is making sandwiches for a party. She estimates 5 sandwiches per person, plus 60 extras.

An equation for this relation is: $t = 5p + 60$, where p represents the number of people and t represents the total number of sandwiches made.

- a) Make a table of values for $p = 0, 10, 20, 30, 40,$ and 50 .

| | | | | | | |
|-----|--|--|--|--|--|--|
| p | | | | | | |
| t | | | | | | |

- b) Graph the relation.



- c) How many sandwiches are required for 100 people?

7. a) Solve each equation. Show your steps.

$$-3x + 5 = 20$$

$$-2(4x - 1) = 26$$

b) Are these two equations equivalent? Explain.

8. $\frac{x}{3} + \square = 10$

Replace the box with a number so that x will have a value of 12.
Verify your solution.

9. Jack was asked to simplify this expression on a test.

His work is shown below:

$$\begin{aligned} & 3 + 6(12 - x) \\ & = 9(12 - x) \\ & = 108 - 9x \end{aligned}$$

Explain Jack's mistake and show the correct simplification.

10. Jill used the distributive property to solve this equation: $4(-x + 3) = 19$

Jill's solution:

a) Explain the two mistakes that Jill made.

$$\begin{aligned} 4(-x + 3) &= 19 \\ 4x + 3 - 3 &= 19 - 3 \\ 4x &= 16 \\ x &= 4 \end{aligned}$$

b) Show how to correctly solve this equation.

11. **Without** solving the equation, show which value, 4, 6, or 8, is the correct solution to the equation $\frac{x}{3} - 7 = -5$. Explain.

12. Write an equation for each sentence, then solve the equation.

a) "When 7 is subtracted from a number divided by 3, the result is 14."

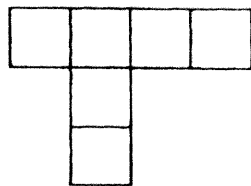
b) "A number multiplied by -3 is added to 5 and the result is -16."

13. You are a member of the Famous Players Movie Points Club. Every time you see a movie, you earn two points. When you earn 100 points, you get a free movie ticket. Right now you have 64 advantage points.

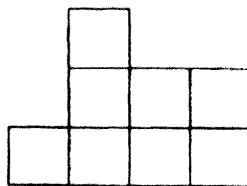
a) Write an equation to show the number of movies you have to watch before you earn a free movie ticket.

b) Solve the equation.

2. Below are the top and front views of an object built of cubes.



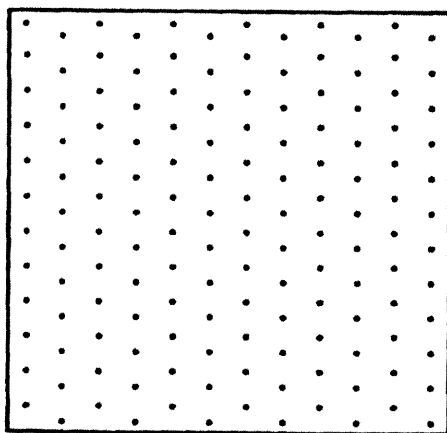
Top View



Front View

a) Draw the 3-D object on the dot paper below.

- **Label the front** of your drawing and state the number of cubes needed to build your object.

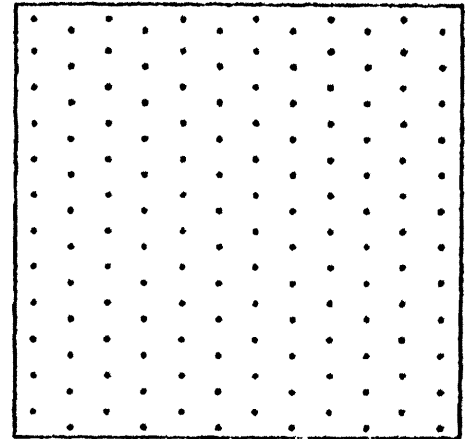
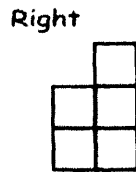
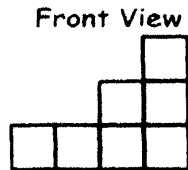
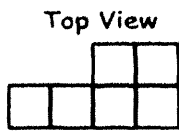


Number of cubes: _____

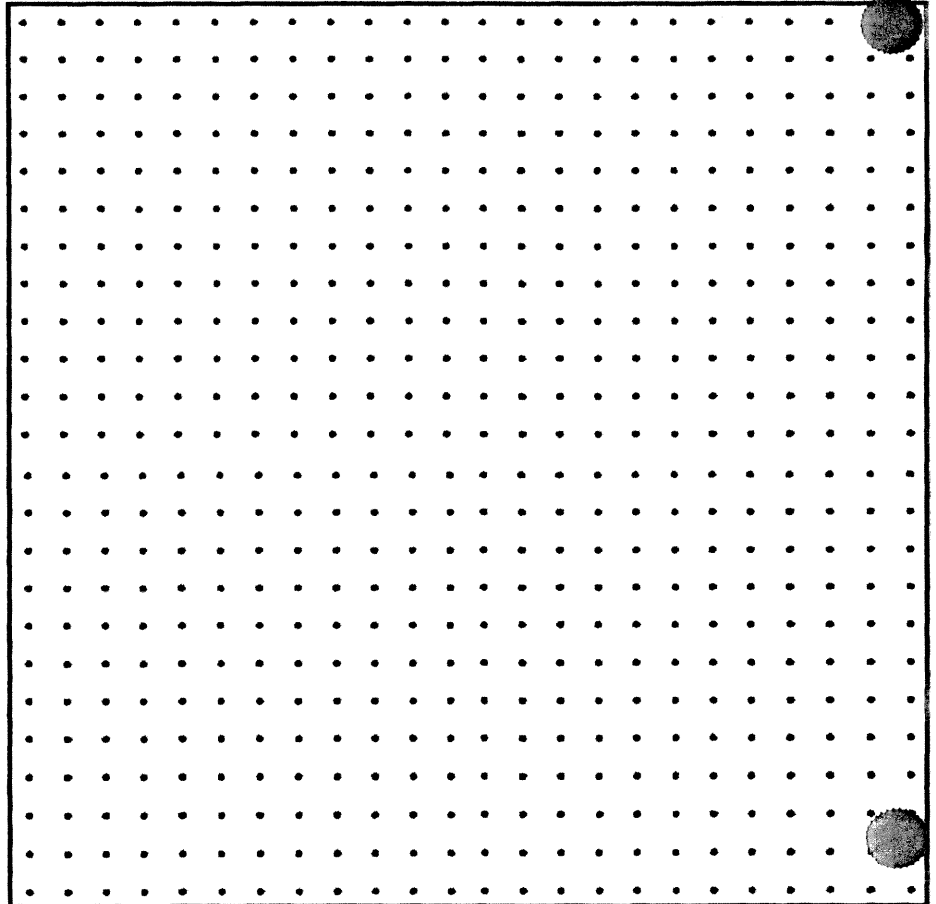
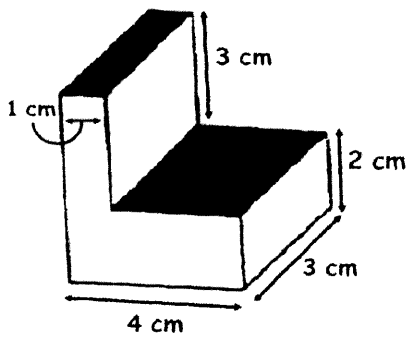
b) Is this the only possible structure with this top and front view? Explain.

3. Sketch a 3-D object that has these three views.

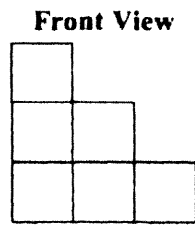
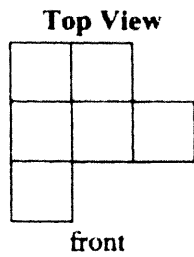
Label the front of the object and shade the top of your object.



4. Draw the front, left side, right side and top view of this object. Use square dot paper and assume each square is equal to 1 cm.



5. A 3-D object has the following views.



- Using at least 9 cubes, sketch two different 3-D objects that have the same top view and front view as shown above.
- Label the **front** of each model.
- Shade the **top** of each model.

