

## Critical Thinking and Problem Solving



**From:**

AL AZHAR RIZQI RIFA'I FIRDAUS

**Class:**

1 I

**Absence:**

01

**Major:**

Information Technology

**Study Program:**

Informatic Engineering

## Meet 2

### Task

1. Give examples of stories or other scenarios where a claim is true but cannot be justified.
2. Give an example of a claim that you think are justifiable or definitely true.
3. Compare the following claims:
  - [A] Polar bears will become extinct in the middle of this century.
  - [B] The polar bear is an endangered species.
  - One of the two claims above is stronger than the other. Which one is strong which one is weak, and why?

### Answer

1. Farel's parents scolded Farel because he played too much and didn't do his homework. Farel feels depressed because his parents don't understand Farel. but farel's parents did this just to make farel better.
2. Farel got 100 marks in his exam because he studied hard.
3. In my opinion claim that strong is A and weak claim is B. because claim A showing detail of time and fact, the poles keep melting. Meanwhile claim B not as clear claim A.

### Assignment

1. Give examples Simple arguments with 3 reasons and 1 conclusion
2. Create standard form and diagrams of simple arguments you create
3. Read the following text:

4. We should not rush into undertaking a large-scale recycling project without carefully weighing the pros and cons. Recycling the materials used may in the long run prove to be uneconomical. The costs of collecting and sorting waste, plus the costs of the recycling process itself, often make the final product more expensive than producing the same product from raw materials. This additional cost has to be paid by someone: if it is not a consumer, then it is the taxpayer in the form of a subsidy. Recycling is also not always the best solution environmentally. The high level of energy required to treat waste can cause pollution. It can also add to global warming.
4. Create standard form and diagrams of the complex arguments above

### Answer

1. I wake up at 5am. And then I get ready. For my trip to rampal takes time 10 to 20 minutes. I jogging because sports very important for healthy.
2. R1 = I wake up at 5am.  
R2 = And then I get ready.  
R3 = For my trip to rampal takes time 10 to 20 minutes.

C = I jogging because sports very important for healthy.

R1 => R2 => R3 = C

3. -

4. R1 = We should not rush into undertaking a large-scale recycling project without carefully weighing the pros and cons.

R2 = Recycling the materials used may in the long run prove to be uneconomical.

R3 = The costs of collecting and sorting waste, plus the costs of the recycling process itself, often make the final product more expensive than producing the same product from raw materials.

C = Recycling is also not always the best solution environmentally.

R1 => R2 => R3 = C

### Task

1. Read the following narration When the city becomes congested with traffic, the usual solution is to charge a fee to take the car to the city center. This works, but it is wrong to do so, as it discriminates in favor of those who can easily afford to pay. The underprivileged in society are punished so that the rich can enjoy the luxury of clean streets. Therefore the cost of ubiquitous congestion must be eliminated. A system of car use rationing should be introduced instead, allowing each driver to enter the city only once or twice per week. Then everyone gets the same benefit.. Make the Main Conclusion on the narration above.

2. Try to find – or make – an argument whose conclusion is supported by explaining reasons (or reasons)

3. Do you agree or disagree with the following statements – and why? "Each argument must make at least one unstated assumption

### Answer

1. A system of car use rationing should be introduced instead, allowing each driver to enter the city only once or twice per week.
2. Sports is very important for health. There are many benefits that we can get from sports. For example, it can burn calories in the body, nourish the heart and much more. Various kinds of sports include jogging, swimming, badminton, and many more.
3. Yes, I agree with the statement above. Because unstated assumption nudging the audience to assume the claim are make sense and need not be critiqued.

## Meet 3

### Task

1. Consider something you might want to buy, such as a car, cell phone, or computer. List the information you need to make a decision about the model or certain type to buy.

2. The gasoline use of a number of cars has been measured. Each car starts with a full tank, then travels (all travels on the same road). After the trip the tank is refilled, the amount of gasoline needed to fill it is recorded. The results are shown below. Sort the car's fuel efficiency (km/liter), from lowest to highest.

3. The pie chart beside illustrates the changing introduction of CDs in 1985 in the recorded music market. The total annual sales of all types of records in 1984 was 170 million and in 1994 they were 234

million. What do you think happened to the actual annual sales of vinyl singles between 1984 and 1994?

A They are down 14 million.

B They are down 5 million

C They don't change.

D They went up 17 million.

E They went up by 64 million.

4 . Pancake stall selling sweet pancakes and savory pancakes. Savory pancakes can have three toppings (eggs, ham, tomatoes) that can be used in any combination. The sweet ones are topped with marmalade (orange jam), lemon or strawberry with ice cream or fresh cream. How many combinations does the kiosk sell?

### Answer

1. Information needed :

- Looking for the need to use a computer.
- search for information about computer components such as ram, motherboard, disk, vga, monitor, case, etc.
- Comparing computer components to get the best price with quality.
- Make a schedule to buy a computer.

2. List :

- Montevideo =  $120 / 10 = 12\text{km/liter}$
- Stella =  $150 / 16 = 9,375\text{km/liter}$
- Riviera =  $200 / 25 = 8\text{km/liter}$
- Roamer =  $185 / 21 = 8,8\text{km/liter}$
- Carousel =  $230 / 16 = 14,375\text{km/liter}$

Sort the car's fuel efficiency (km/liter), from lowest to highest :

1. Riviera
2. Roamer
3. Stella
4. Montevideo
5. Carousel

3. Known data :

1984 = 170.000.000 with 44% Vinyl singles

1994 = 234.000.000 with 26% Vinyl singles

Calculate data :

$170.000.000 * 44\% = 74.800.000$

$234.000.000 * 26\% = 60.840.000$

- The answer is A. They are down 14 million.

4. Savory pancakes can have three toppings (eggs, ham, tomatoes) that can be used in any combination. The sweet ones are topped with marmalade (orange jam), lemon or strawberry with ice cream or fresh cream.

The combination :

- Savory pancake ( eggs, ham, tomatoes, eggs-ham, eggs-tomatoes, ham-tomatoes, eggs-ham-tomatoes )
- Sweet pancake ( marmalade (orange jam), lemon or strawberry with ice cream or fresh cream, marmalade-lemon, marmalade-strawberry ice cream, marmalade-strawberry cream )
- There is 13 combination.

## Assignment

1. If the distance from Jakarta to Ontario – Canada is exactly 14000 km, a plane takes 22 hours to depart. Meanwhile, from Ontario to Jakarta, the time needed is only 17 hours due to the wind conditions blowing in the direction of the plane's speed. Assuming the aircraft is moving at a constant speed in both directions of flight (depart & return) and in stable clear air without clouds, what is the average wind speed on that flight?

2. Yasmin has been saving for a long time to buy a gift for her sister's birthday. Every time he has coins with a face value of 5 cents and 20 cents, he puts them into his piggy bank. Today he broke his piggy bank and counted all the money in it. He calculated by stacking the coins so that they became piles worth 1 USD in each pile. When he finished, he realized that the piles of coins he made were of different heights. If 1 USD = 100 cents, and if the 5 cent vs 20 cent coin thickness is exactly the same, then how many stack classes are there based on their height?

A.5

B.6

C.10

D.20

3. At the bank where I deposit money, the ATM pin consists of a 4-digit number. It can be very difficult to always remember the Pin. To make it easier to remember, I created my ATM pin in the following way:

- The first 2 digits are my date (day) of birth, reversed.
- The remaining 2 digits are my birth month, reversed as well.
- If the date or month is 1 digit, then 0 is added before it is reversed.

Which of the following PINs CANNOT be my PIN?

A. 3221

B. 5060

C. 1141

D. 2121

E. 1290

4. I went to buy fruit at a market in Waylandpuro and asked one of the fruit sellers there: “Sir, how much do you buy 1 orange for?”. The seller said, 1 orange plus 1 lemon costs Rp. 2000. Then he said again (which confused me even more), if 1 lemon equals 1 grapefruit it becomes Rp. 3000. He said the price of each fruit is different. Based on this unhelpful information, which of the following can be confirmed?

- A. 1 orange is more expensive than 1 lemon.
- B. 1 lemon is more expensive than 1 grapefruit.
- C. 1 grapefruit costs more than Rp. 1000.
- D. 1 orange costs less than Rp. 1000.

### Answer

1. Known data:

- Distance is 14.000km
- Jakarta – Ontario 22 hours
- Ontario – Jakarta 17 hours
- Plane speed = x
- Wind speed = y

Calculation :

Equality

$$17(x+y) = 14.000$$

$$22(x-y) = 14.000$$


---

$$17x + 17y = 14.000$$

$$22x - 22y = 14.000$$


---

The first equality be multiply by 1,3

$$22x + 22y = 18.200$$

$$22x - 22y = 14.000 +$$


---

$$44x = 32.200$$

$$x=731,818 \text{ (speed plane)}$$


---

take equality 1 to substitution

$$17(x+y) = 14.000$$


---

$$17x + 17y = 14.000$$


---

$$(17 \times 731,818) + 17y = 14.000$$


---

$$12.440,906 + 17y = 14.000$$


---

$$17y = 14.000 - 12.440,906$$

$$17y = 1.559,904$$

$$Y = 91,711$$

So the speed wind is 91,711 km/hours

2. Stack :

- Stack 1 = 5 x 20 cent
- Stack 2 = 20 x 5 cent
- Stack 3 = 1 x 20 cent and 16 x 5 cent
- Stack 4 = 2 x 20 cent and 12 x 5 cent
- Stack 5 = 3 x 20 cent and 8 x 5 cent
- Stack 6 = 4 x 20 cent and 4 x 5 cent

And then the answer is B. 6 stack

3. Known data :

- The first 2 digits are my date (day) of birth, reversed.
- The remaining 2 digits are my birth month, reversed as well.
- If the date or month is 1 digit, then 0 is added before it is reversed.

The answer is C. 1141, because month only have 12 not until 14

4. My assumption:

- 1 lemon = Rp1.000, because 1 orange plus 1 lemon = Rp. 2000.
- if 1 lemon equals 1 grapefruit it becomes Rp. 3000, and then price of grapefruit Rp2.000
- and then the answer is C. 1 grapefruit costs more than Rp. 1000.

## Task

1. The solid on the right, a cube with two corners cut off, is made of a piece of cardboard that is shaped and folded. (The dotted line represents the hidden edge.) Which of the following folds of cardboard is suitable for creating the shape?
2. I use the tripmeter in my car to measure the distance traveled since the last time my car was serviced, so I know when the next service is due. The trip meter can be set to zero at the push of a buGon and records the kilometers traveled since the last reset. I set the trip meter to zero after my last serve. The next service is scheduled after 20,000 km has been covered. Some time later, I lent the car to my brother. I forgot to tell him about the trip meter; he pressed the zero buGon and drove 575 km. I then started driving again without realizing what he had done. If I want to know how much the trip meter should read when the next service is due, what additional information do I need? Explain!
3. A new marketing company is selling an unusual liquid watch. The liquid clock consists of two tubes as shown. The righthand tube is gradually filled until it is full at the end of each hour, and then it is emptied and started again. The left tube does the same in 12 hours. The time shown on the clock is 9.15. Draw what the liquid clock looks like at 4.20
4. Students at the school must decide what subjects they will study next year. English, science, and math are all compulsory, but they can choose from the remaining four subjects. The table shows

how choices can be made. Students must select one subject from each column. The fourth subject can come from any column. Which of the following combinations is not allowed?

- A French, geography, physical education, art
- B French, German, Latin, music
- C technology, German, art, history
- D French, German, geography, music
- E geography, music, French, religious studies

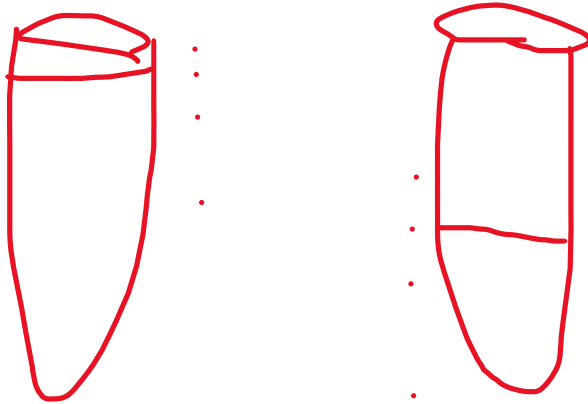
### Answer

1. folds of cardboard is suitable for creating the shape is B. Because there are equilateral triangles that are parallel, just like the finished picture .
2. Known data :
  - He pressed the zero button and drove 575 km.

What to do to find information :

- Ask brother for the last kilometer.
  - And then amount last kilometer with 575.
3. Known data :
    - The righthand tube is gradually filled until it is full at the end of each hour.
    - The time in image is 9.15

The liquid clock when 4.20 :



4. Known data :
  - They can choose from the remaining four subjects.
  - The table shows how choices can be made.
  - Students must select one subject from each column.



- The fourth subject can come from any column.

The answer is D. French, German, geography, music. Because French and Germany there is in one column, then geography and music too.