

Introduction to Problem Solving & Critical Thinking - 2

Part 13b2 of
“Electronics and Telecommunications”
A Fairfield University E-Course
Powered by LearnLinc

Sections 13/14 Schedule

Session 13a	11/05	Intro to Problem Solving & Critical Thinking	Notes
Session 13b	11/10	Fun with Word Problems	Notes
Session 13c	11/12	Fun with Word Problems	Notes
MT7 (Sat,Cheshire)	11/15	CT Mastery Test, Pt 7	
MT7 Results	11/17		
Session 14a	11/19	Intro to Applied Technical Mathematics	Notes: Binary/Octal/Hex, Powers of 10, Basic Algebra
Session 14b	11/24	DC & AC Motors	Elect1-7: pp. 7-39: 7-69, pp. 7-89: 7-117
Session 14c	11/26	Levers/gears, Torque/HP/RPM	
Quiz 14 Review (Quiz 14 due 12/07)	12/01		
Quiz 14 Results	12/08		
MT8 (Sat,Cheshire)	12/13		
MT8 Results	12/15		

Section 13:

Problem Solving and Critical Thinking

- Word puzzles
- Read carefully
- Use simple logic
- Some algebra (but avoidable)
- No trick questions
- Some general world knowledge
- Some questionable wording
- Explain “why” to give me flexibility

MindTrap

- A word puzzle game from Pressman Toy Corporation.
- Here there are some trick questions (groan)
- Designed to be fun for ages 12 \$ up

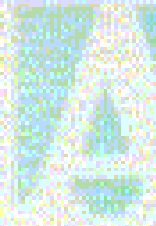
AGE

Q

MINDTRAP

The day before yesterday Scheming Suzie was nine years old. Next year she will be twelve. How is this possible?

Age - Answer



MINDTRAP

The statement was made on January the first and Suzie's birthday is on December 31st. Therefore Suzie was nine the day before yesterday (December 30), she was ten yesterday (December 31), and later on this year she will be 11. Therefore it stands to reason that next year she will be 12.

Ancient

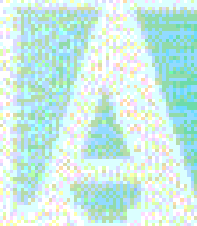
Q

MINDTRAP



Professor Herring just returned from a six month vacation in the Middle East. In one of the lectures she gave, she said the highlight of the trip was seeing many of the ancient artifacts first hand. She made mention of having seen several mummies and tapestries dating as far back as 200 B.C. She claimed to have seen coins dated 46 B.C., and weapons made of metal from approximately 500 B.C. What is wrong with Professor Herring's claims?

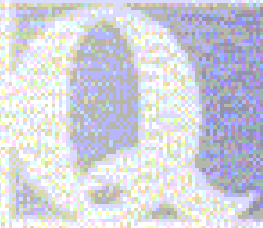
Ancient-Answer



MINDTRAP

Coins were never dated 'B.C.'

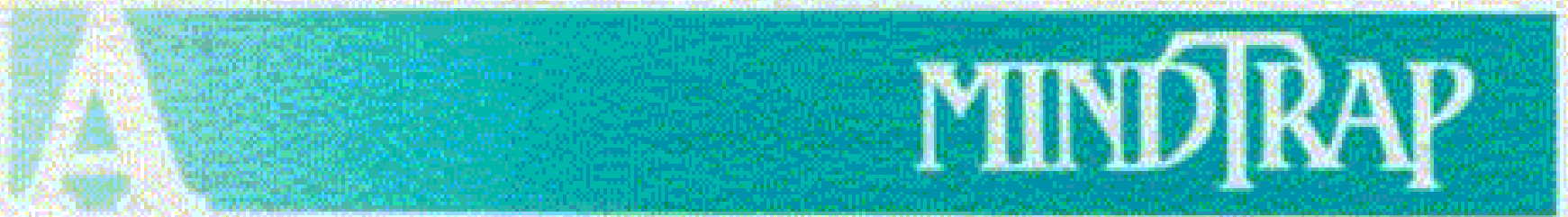
Angle



MINDTRAP

Shadow was examining an angle measuring $14 \frac{1}{2}$ degrees, using his magnifying glass that magnifies everything two times. Under the glass, how large would that angle measure?

Angle - Answer



14 1/2 degrees.

Bridge

Q

MINDTRAP

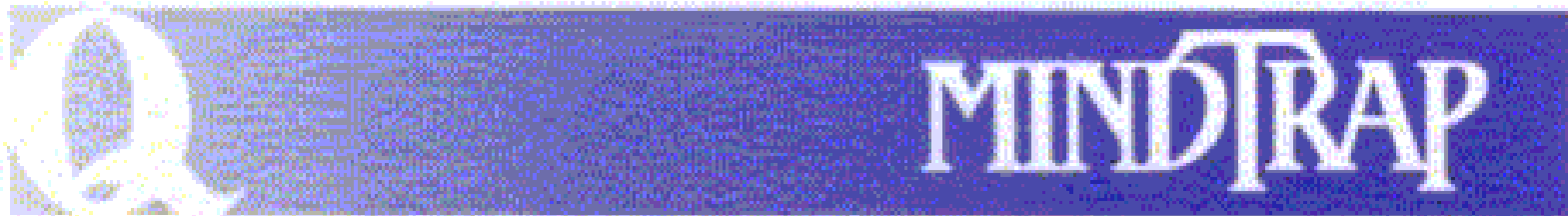
Mack White stopped his tractor trailer at the foot of an old bridge. The trailer was air tight except for two screen doors at the rear. The trailer had a second set of doors which could be closed over the screen doors enabling him to seal the trailer air tight. Mack closed the second set of doors and began to pound on them. When a passerby asked him what he was doing, he replied, "I've got 2000 pigeons in the back and I think they're too heavy for this old bridge. I'm making the 'little buggers' fly around so they'll lighten the load 'till I get across". Will Mack's idea lighten the load or will it be the same?

Bridge - Answer

A MINDTRAP

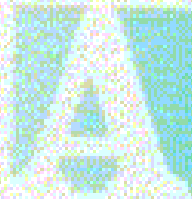
In this *air tight* trailer, the situation will be the same as before. A bird flapping its wings will cause alternate up and down accelerations which will average out. A downward flap creates a pressure greater than the weight of the bird and an upward flap decreases it. It would be safe to say that with 2000 birds flapping their wings, the resulting average of upward and downward pressures will leave the weight unchanged.

Camels



“That Abdullah is one rich Arab,” muttered Ali Buba.
“As a matter of fact, he owns 100 or more camels.”
“Not a chance,” replied Ishmael, “I know for certain he owns fewer than 100 camels.” Farouk joined in, “Well let us put it this way, he owns at least one camel.” If only *one* of their statements is true, how many camels does Abdullah own?

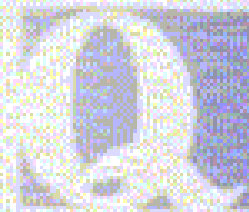
Camels - Answer



MINDTRAP

Abdullah doesn't own any camels. If the first statement is true, then so is the last statement, which cannot be, since there is only one true statement. Also, if the last statement is true, then so is the second statement. Since we know that two statements cannot be correct, we can disregard both the first and the third statements. This leaves us with only the middle statement. If Abdullah owns any camels at all, it will make the third statement correct, so the only number of camels that Abdullah can own is zero.

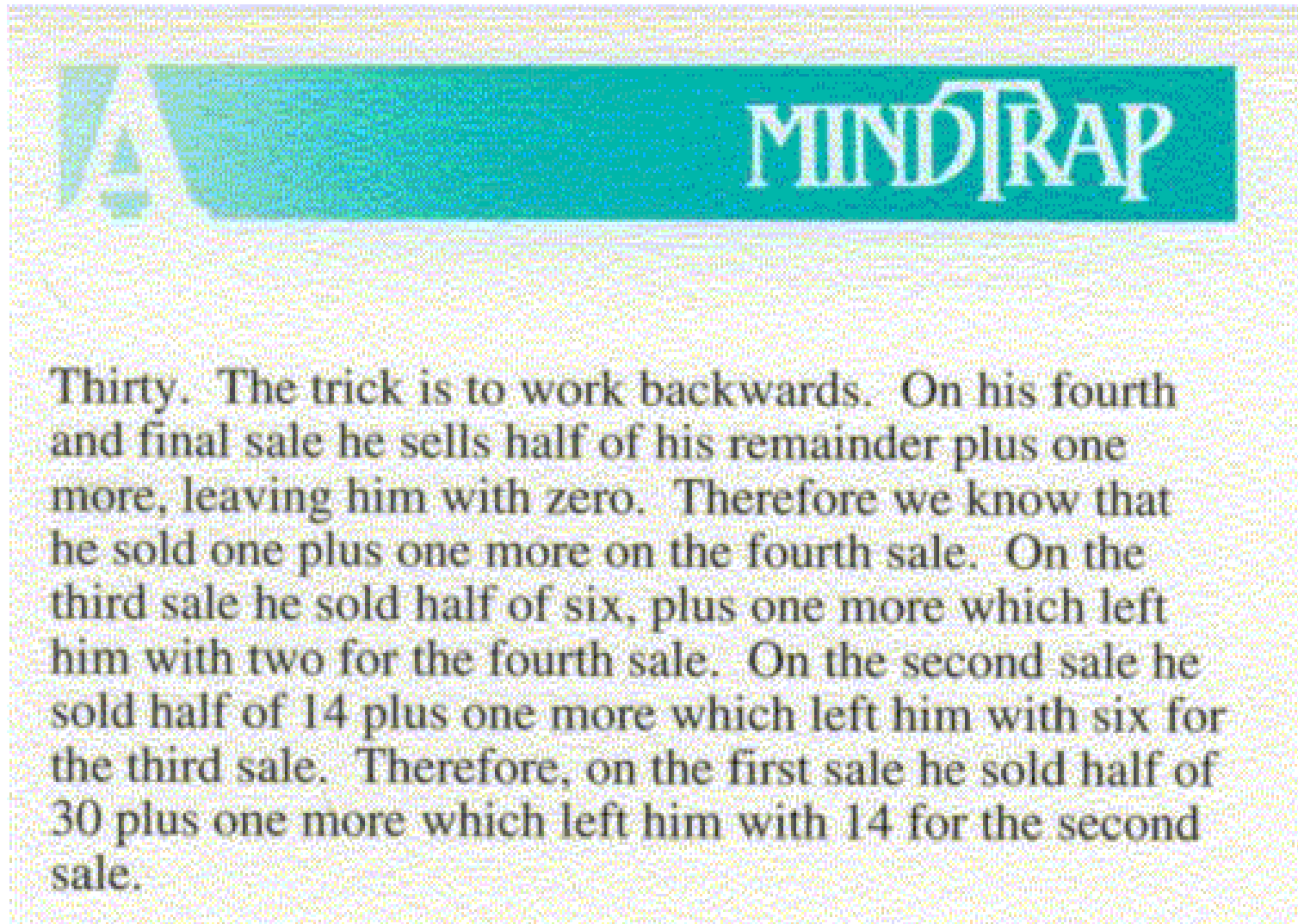
Cars



MINDTRAP

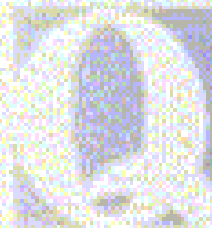
Pete Polyester is a used car salesman. He sold half his cars plus one more to his first customer of the day. To the second customer, he sold half of the remainder plus one more. To the third customer, he sold half the remainder plus one more; and to the fourth customer, he sold half the remainder plus one more. Pete was now the proud salesman on an empty car lot. How many cars did Pete have for sale at the start of this fantastic day?

Cars - Answer



Thirty. The trick is to work backwards. On his fourth and final sale he sells half of his remainder plus one more, leaving him with zero. Therefore we know that he sold one plus one more on the fourth sale. On the third sale he sold half of six, plus one more which left him with two for the fourth sale. On the second sale he sold half of 14 plus one more which left him with six for the third sale. Therefore, on the first sale he sold half of 30 plus one more which left him with 14 for the second sale.

Clock

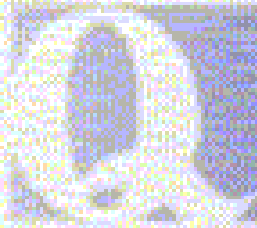


MINDTRAP

There is a grandfather clock that chimes the appropriate number of times to indicate the hour, as well as chiming once at each quarter hour. If you were in the other room and heard the clock chime just once, what would be the *longest* period of time you would have to wait in order to be certain of the correct time? (The clock is working properly and is set at the correct time.)

Clock - Answer

Coins

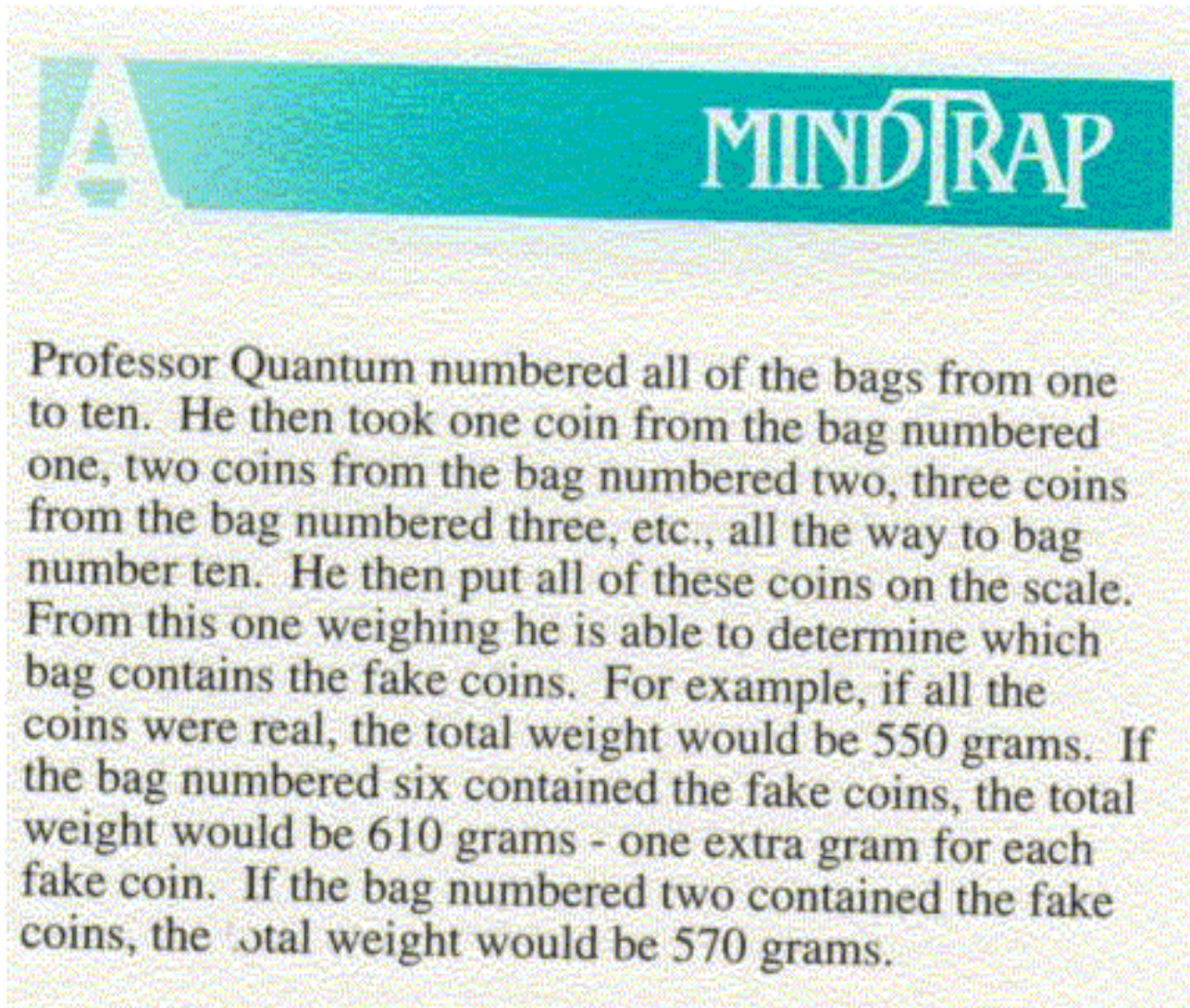


MINDTRAP



Professor Quantum has ten bags of coins which all look alike. One of the bags is filled with fake coins. All the genuine coins weigh 10 grams each and all the fake coins weigh 20 grams each. Each of the ten bags contain 20 coins. Using a scale which measures in grams, how would Quantum be able to determine which bag contains the fake coins with only one weighing?

Coins - Answer



Dipper



MINDTRAP



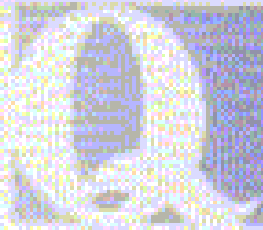
It was midnight when Shadow pulled up to the home of Sam Sham. Sam was on his front lawn photographing the heavens. Shadow began: "There was a break-in at a local jewelry store a couple of hours ago and an eye witness claims to have seen a man fitting your description fleeing the scene." Sam quickly replied, "It wasn't me, I've been here taking a picture of the 'Little Dipper' for the past two hours. The stars are particularly clear on such a dark night." Sam clicked the shutter of his camera closed and said, "There, I've just finished a two hour exposure. I'll go and develop this picture and prove my innocence." When Shadow examined the developed photograph, he saw a perfectly clear picture of the 'Little Dipper'. Would this picture substantiate Sam's alibi?

Dipper - Answer



This picture would incriminate him. If Sam had his camera lens open for the past two hours as he claimed, the 'Little Dipper' would not have appeared perfectly clear. Because of the earth's rotation, the picture of the 'Little Dipper' should have appeared as a series of lines. It's obvious Sam had just started the exposure when Shadow arrived.

Divide



MINDTRAP

If you divide thirty by half and add ten, what is the answer?

Divide - Answer

A

MINDTRAP

The answer is seventy. When dividing by fractions, you must invert and multiply.

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