CS 2104
Introduction to Problem Solving

Test Your Mind

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Slides based on the “Problem Solving and Comprehension” book

Goals:

- Increase the students' *power to analyze* problems
- Learn to recognize and *avoid ineffective* problem-solving methods
- Adopt the method that good problem solvers use
- *Practice* in applying this method to a variety of comprehension and reasoning questions
- Improve in their analytical thinking skills and, be more effective, and more confident problem solvers

WASI

- Whimbey Analytical Skills Inventory (WASI)
- Measures reasoning ability to find out about *your thinking skills*
- Helps you to find out about your own thinking habits and compare them to other people
- The type of test you might take in applying for a job
- You can compare your problem-solving strategies

WASI

- Notice the sequences of thoughts used by students who answered the question successfully.
- Compare the approaches leading to the correct answer with those leading to incorrect answers.
- Pinpoint how the approaches differ.
- Most importantly, for every question that you answer incorrectly,
- Be sure you understand exactly why the error occurred, and
- How you can avoid such an error in the future.

What is the advantage?

- Asking people to explain their answers to the test questions, and
- to compare the explanations

  - learn from each other
  - understand how to attack problems effectively

- Take the test

Errors in Reasoning

- Goal: Identify common types of errors and avoid them.
- Many of these come up in the WASI – A major reason for taking it is so that you can self-identity errors that you tend to make
- Many points are lost on tests/homeworks in school come from errors in reasoning, not from lack of knowledge or skills.
- You can train yourself to reduce making this sort of mistake.

Type of Errors

- Lack of knowledge or skill
  - Not our focus
- Failure to observe and use all relevant facts of a problem
  - Reading so fast
- Failure to approach the problem in a systematic manner, skip steps or jump to conclusion
- Failure to spell out relationships fully
- Being sloppy or inaccurate – making “simple” mistakes

Question 7

In a different language *liro cas* means “red tomato,” *dum cas dan* means “big red barn” and *xer dan* means “big horse.” What is the word for *barn* in this language?

a. *dum*
b. *liro*
c. *cas*
d. *dan*
e. *xer*

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e. *xer*

liro cas means “red tomato”
dum cas dan means “big red barn”
xer dan means “big horse”

(a)
(d) nonanalytical thinkers

Question 9

There are 3 separate, equal-size boxes, and inside each box there are 2 separate small boxes, and inside each of the small boxes there are 4 even smaller boxes. How many boxes are there altogether?

a. 24

b. 13

c. 21

d. 33

e. some other number

Question 9

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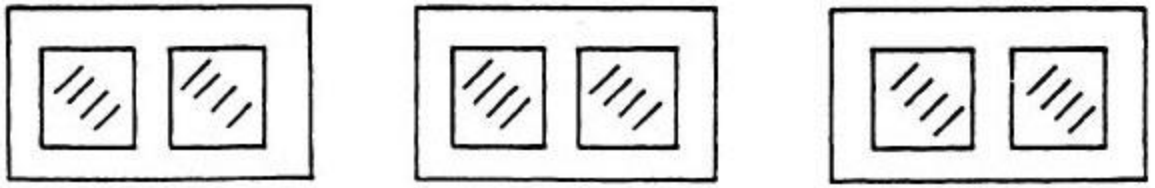

(d)

(b) inadequate reasoning

Question 10

Ten full crates of walnuts weigh 410 lb, while an empty crate weighs 10 lb. How much do the walnuts alone weigh?

a. 400 lb

b. 390 lb

c. 310 lb

d. 320 lb

e. 420 lb

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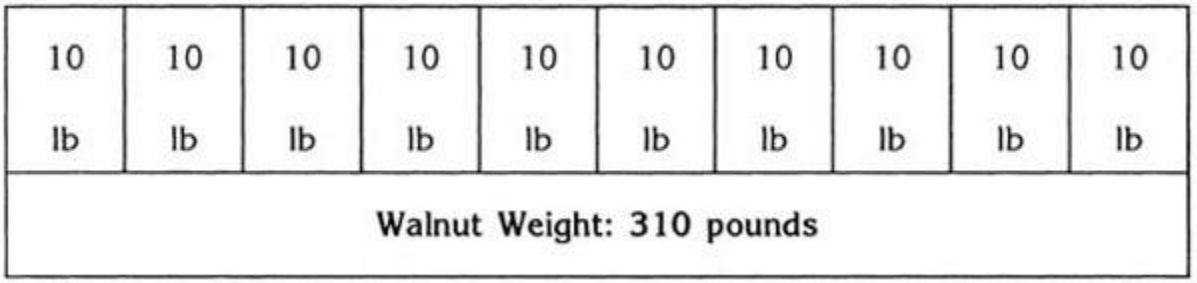


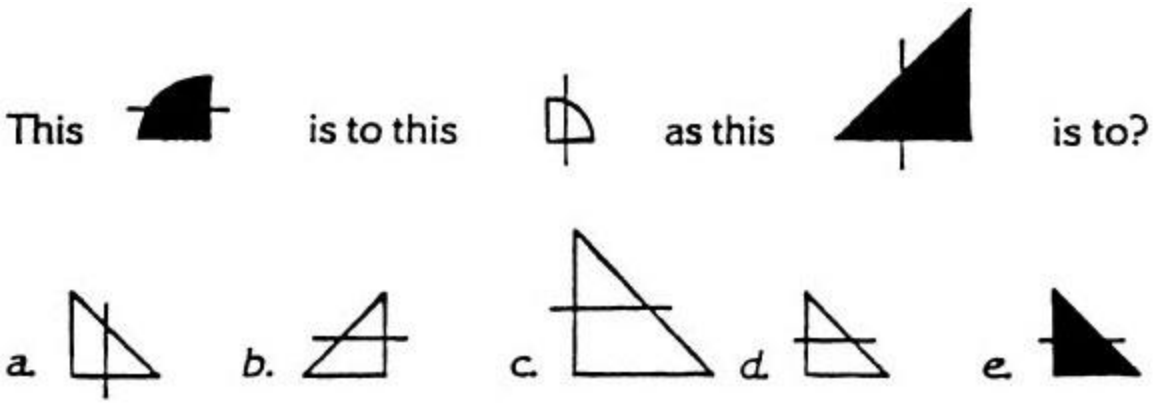
Total Weight: 410 Pounds

(c) :410 – 10*10

Error: Not spelling numerical relationships out fully

Question 12

The first figure is related to the second figure in the same way that the third figure is related to one of the answer choices. Pick the answer.



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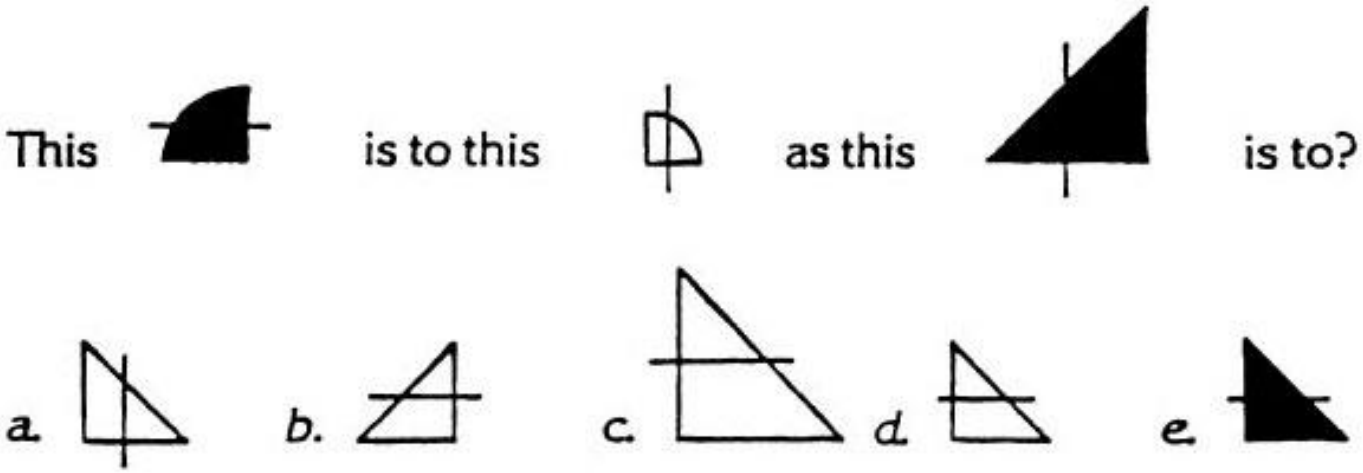

(d)

Error: fail to search out and use all the available information

(e) Neglecting to change the shading

(c) Neglecting the size

Question 18

Cross out the letter after the letter in the word **pardon** which is in the same position in the word as it is in the alphabet.

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Cross out the letter after the letter in the word **pardon** which is in the same position in the word as it is in the alphabet.

- Sample of a verbal reasoning problem
- Cross out letter “o”
- Errors:
  - fail to search out and use all the available information
  - Cross out “d” in “pardon” :
    - part of the problem has been lost
  - Cross out “d” in “word” :
    - Fail to work step-by-step through a complex sentence

Error Types Checklist

- Inaccuracy in Reading
- Inaccuracy in Thinking
- Weakness in Problem Analysis; Inactiveness
- Lack of Perseverance

- Failure to Think Aloud
  - Want to practice for this course
  - As you work through the problem, vocalize thinking in detail, explain the steps
  - Solver/listener paradigm

problem
solving
solution
complex
tasks
skills
logic
research
defined
used
occurs
system
process
work
best
goal
skill
simple
cognitive
steps
difficult
analysis
study
initiated
solutions
reasoning
possible
state
world
real
action
human
large
relation
researchers
control
found
step
fail
theory
product
knowledge
solver
direct
novel
emphasis
attempts
approaches
past
focused
cause
include
decision
taken
life
resolution
psychology
capacity
solved
certain
difficulty
technique
outside