

1.4 Proving Conjectures: Deductive

Reasoning

Sherlock Holmes: The Master of Deduction!

Ace Ventura also has some skill!

Definitions:

LOGICAL REASONING: Using what you are given and what you already know to form conclusions.

DEDUCTIVE REASONING: Drawing a specific conclusion through logical reasoning by starting with general assumptions that are known to be valid.

EX. "All the students in Math received their mark today on their last Unit Exam. Shaylene was in class today.

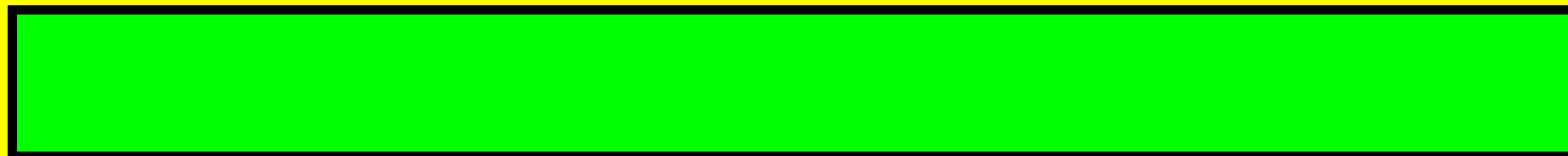
Did Shaylene receive her exam mark today?

Using DEDUCTIVE REASONING, complete the following:

a) Anyone who jogs regularly will be fit.
Jimmy jogs regularly.

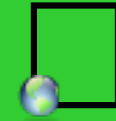


b) The sum of the angles in any triangle is 180 degrees. In triangle ABC, angle A is 90 degrees.



For another example, see P. 29 of text.

COMPARE inductive and deductive reasoning



Inductively. . .

- a) Choose a number. Double it. Add 5.
Add your original number.
Add 7. Divide by 3.
Subtract your original number.
Repeat this starting with 4 different numbers.
Make a conjecture.

Conjecture:

Deductively: Use variables so it can apply to any situation.

n

$2n$

$2n + 5$

$2n + 5 + n = 3n + 5$

$3n + 5 + 7 = 3n + 12$

$(3n + 12) / 3$

$n + 4 - n$

Result: 4

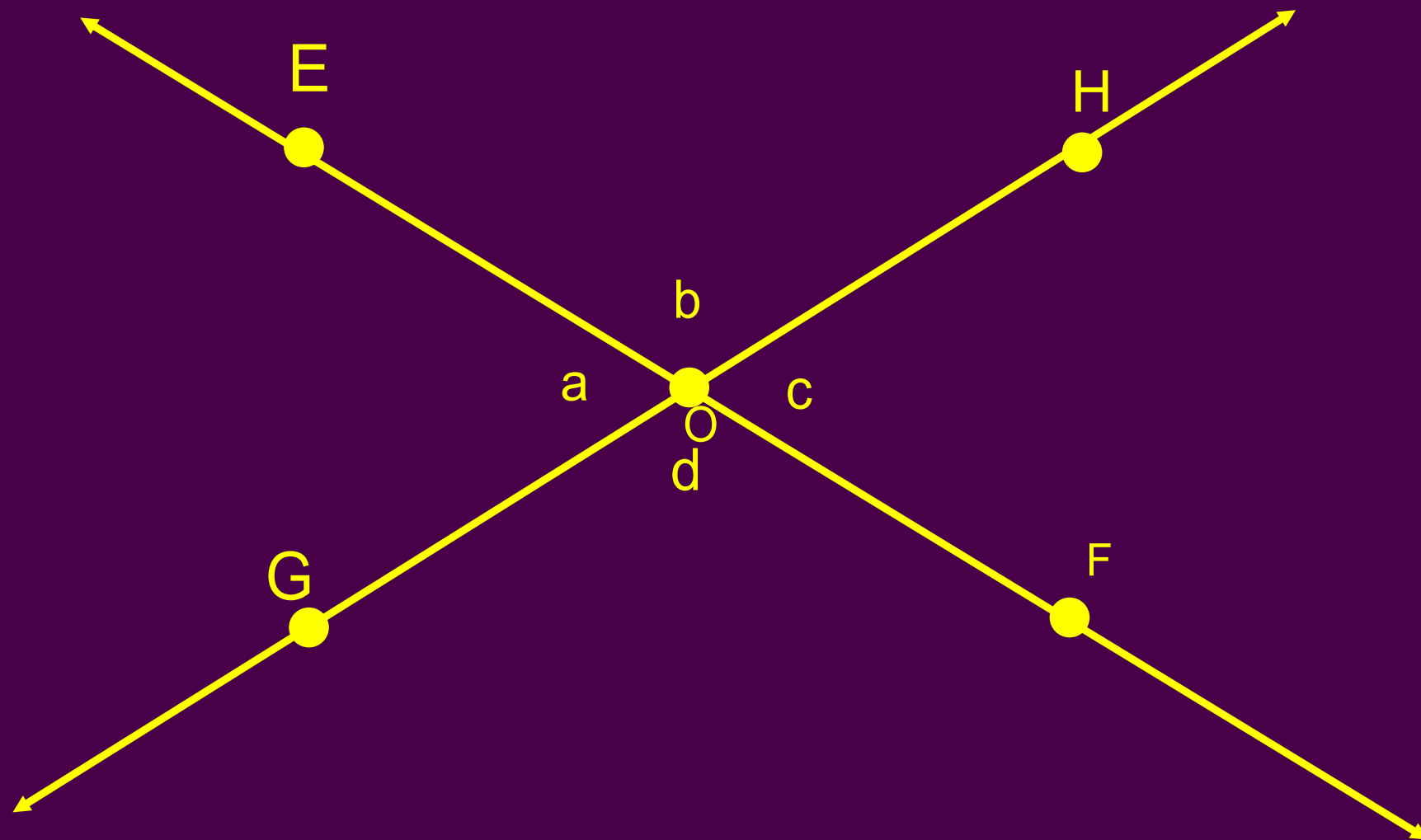
Ex. 2, P. 28 Using Deductive Reasoning to Generalize a Conjecture:

conjecture: The difference between consecutive perfect squares is always an odd #.

P. 29 Ex. 4

In **DEDUCTIVE REASONING**, variables are used in the proof so it can apply to any situation.

Ex. Prove that vertically opposite angles are equal.



Since angle GOH is a line then

$$a + b = 180^\circ$$

Since angle EOF is a line then

$$b + c = 180^\circ$$

Thus

$$a + b = b + c$$

subtract "b" from both sides

$$a = c$$

Thus angle EOG = angle HOF

Do #4 together first!
Practice P. 31 - 33
2,4,5,7,8,9,10,12,17

Mid-Unit Practice P. 35 #2,7,8,9

Quiz next day!!
Topic 1.1-1.4