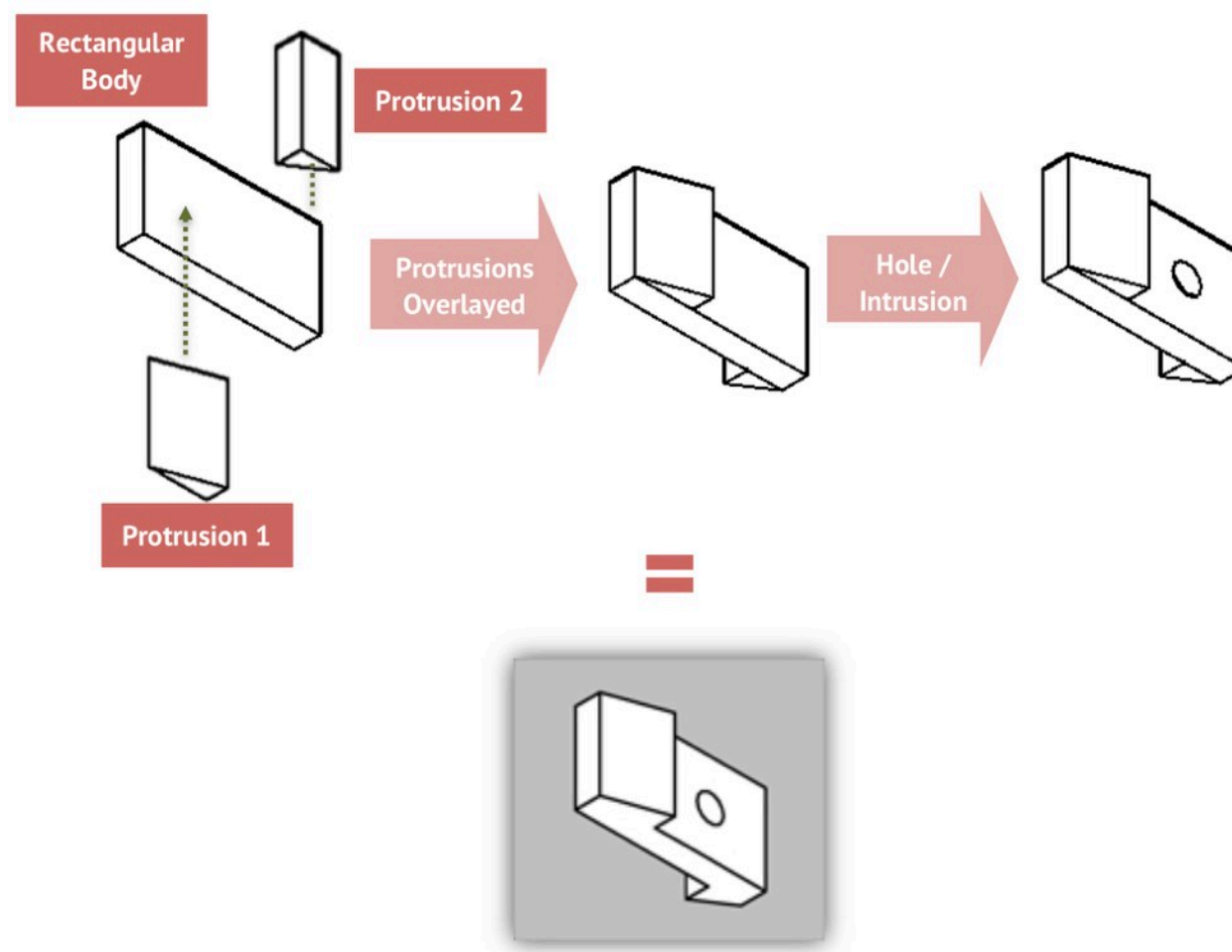# PROTRUSIONS, INTRUSIONS & HOLES

- Most common and most diverse type of shape
- Basic shape with extending protrusions, intruding intrusions and holes galore
- Proportionality of the extensions/intrusions and position of all elements determine these keyholes
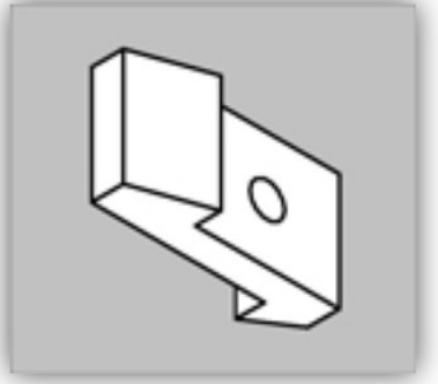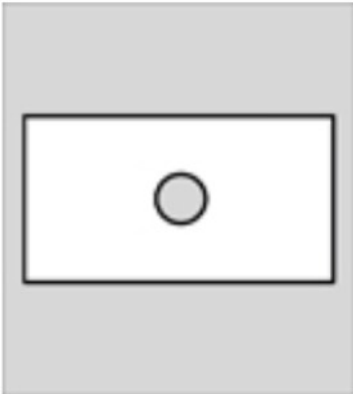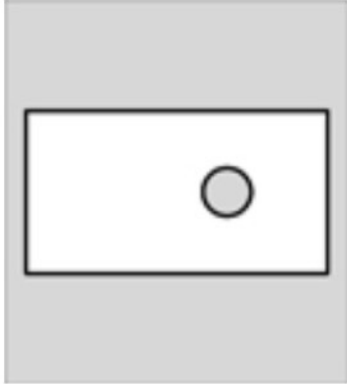
DEFINITION

This type of problem has a basic shaped body (usually a rectangular solid) and is further defined by extending protrusions, intrusions into the basic shaped body and/or holes through the body. Usually 3-4 problems per test.

HOW IT'S MADE? TRICKS?

Rectangular Body

Protrusion 2

Protrusions Overlayed

Hole / Intrusion

Protrusion 1

=

CRACKDAT.COM

Crack DAT

PROTRUSIONS, INTRUSIONS & HOLES

1. POSITIONING

Understanding the relative positions of the protrusions/intrusions/holes in each orthographic view. Let's look at an example with the FRONT view:

EXPLANATION

Everything is proportionally and shape-wise correct in this keyhole. However, you must decide where that hole is – in the center of the rectangular body or offset to the side? In this case it should be a bit offset / translated to the side.

Correct! The hole is offset a bit to the right, reflecting the correct position of the the hole in the rectangular body in the 3D model.
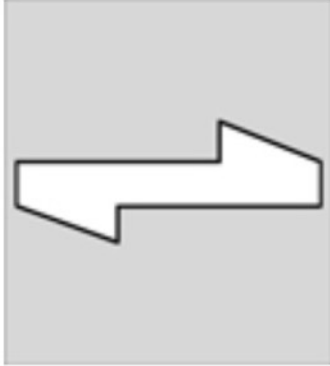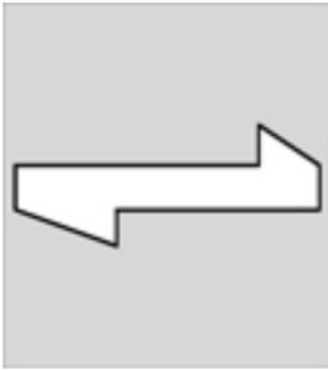
2. HOLE ILLUSIONS

Mistaking a protrusion as an intrusion/hole. You'd be surprised how common this error can be, especially in a stressful, testing situation. An example with the FRONT view:

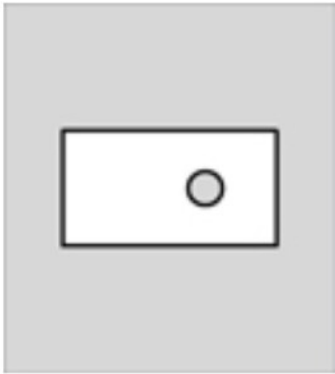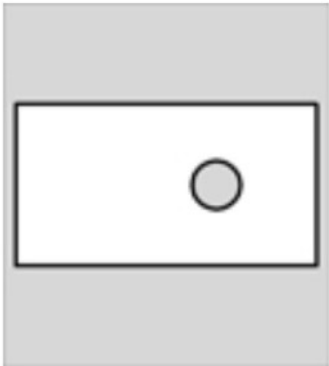| EXPLANATION		
EXPLANATION	The rectangular protrusion/ platform at the bottom front of the object is, well, a protrusion! In this keyhole, it is suggesting there there should be a hole/intrusion instead with the gap at the bottom.	Correct! The gap should be filled – it is solid after all!

CRACKDAT.COM

3. PROPORTION

An element of the keyhole is too wide/thin, long/short, angled incorrectly to reflect the proportionality of the 3D model. An example with the TOP view:

EXPLANATION	This keyhole suggests that the two triangular protrusions at the ends of the object are the same length. In fact, one is larger than the other, so this must be incorrect.	Correct!

4. SCALE

EXPLANATION	Even though proportionally and shape-wise this keyhole is correct, the gross difference in scale makes it much too small for the object to fit through! You should be able to tell if keyholes are too large as well!	Correct! This is the correct scale.