

# Answer Keys & Grading Notes

Objective-aligned exemplars, full-credit models, and the mistakes to watch for. **Do not distribute to students.**

**True-up step:** the objective sections below are built from the AP learning objectives. Paste your real Code.org prompts into chat and I'll fill exact question-by-question keys. The *AI-Proof Worked Answers* section matches the handwritten assignment exactly.

## A · Integer division & modulo

Expression	Result
$7 / 2$	3 (int division truncates)
$7 \% 2$	1
$7.0 / 2$	3.5 (double division)
$17 \% 5$	2
(double) $7 / 2$	3.5 (cast before divide)
$10 / 3 * 3$	9 ( $10/3=3$ , then $*3$ )

**Common mistakes:** Expecting  $7/2 = 3.5$  (it's 3 for ints); casting AFTER the division instead of before; forgetting % gives the remainder.

## B · Precedence & casting

**Full-credit exemplar:** Multiplication/division/modulo before addition/subtraction; cast binds tightly: (double)x / y casts x first. Full credit shows each step.

**Common mistakes:** Ignoring precedence; casting the whole result instead of one operand; int overflow not recognized.

## AI-Proof Worked Answers — Primitive Types — Handwritten Expression FRQ

Grade the handwritten sheet against these. Item numbers match the assignment.

Item	Correct answer
1a) $9 / 2$	4 (int division truncates)
1b) $9 \% 2$	1
1c) $9.0 / 2$	4.5 (double)
1d) $17 \% 5$	2
1e) (double) $9 / 2$	4.5
1f) $7 / 2 * 2$	6 ( $7/2=3$ , then $\times 2$ )
2) average as double	(double)(a+b+c)/3 or (a+b+c)/3.0
3) $7/2$ vs $7.0/2$	$7/2$ is $\text{int}:\text{int} = 3$ ; $7.0/2$ has a double operand $\rightarrow 3.5$