


# Roomba® i7 Teardown

## Answer Key

Question #	Clue <small>(solve the problem to see the time during the video where this question happens—your answer will be minutes and seconds. i.e., 128= 1 min 28 sec)</small>	Timestamp	Question	Answer
1	$4 \times 29 =$	1:16	What is interesting about taking apart a robot vacuum?	See how it works, see the engineering, see what's inside.
2	$(50 \times 2) + 29 =$	1:29	What is Roomba's purpose? What is its job?	To Clean Intelligently
3	$25 \times 6 =$	1:50	What is something you need to wear for safety before taking anything apart?	Safety Glasses
4	$(100 \times 2) + 10 =$	2:10	Draw the pattern on the rubber rollers (extra points if you tell us what Irene calls the shape)	 Chevron-Shaped Fletches
5	$220 - 5 =$	2:15	What part helps scoop up the dirt into the bin?	Rubber Rollers (and the chevron pattern)
6	$(400 / 2) + 18 =$	2:18	What is the dirt detect sensor actually called?	Piezoelectric Sensor
7	$468 / 2 =$	2:34	Why are you able to wash the bin in this robot? What is missing?	No electronics
8	$(100 \times 3) + 5 =$	3:05	What part helps get the dirt out of corners and along the walls?	Side brush
9	$(600 - 300) + (10 \times 4) =$	3:40	Why did they need to take the battery out of the robot?	For safety!
10	$(800 / 2) + (5 \times 2) =$	4:10	What does the "halo" feature of the RCON do?	Sets up a ring or circle around something so the robot doesn't go there

11	$531 - 27 =$	5:04	Pick one—a cliff sensor is an: Acoustic Sensor? Optical Sensor? Temperature Sensor?	Optical Sensor
12	$500 + (4 \times 5) =$ $600 - 15 =$	5:20 5:45	Let's add: If you count all the FRONT cliff sensors and ALL the wheels on Roomba—how many parts do you have?	4 cliff sensors + 1 caster wheel + 2 main wheels = 7
13	$(200 \times 4) + (30 - 2) =$	8:28	What does the Polarity switch in the Roomba wheel module do?	Changes the direction the motor spins, reversing the wheel direction.
14	$900 - 45 =$	8:55	Before the optical sensors, the robot had a two-color caster wheel—what colors were they?	Black and White
15	$(1800 / 2) + (40 + 3) =$	9:43	Electrostatic discharge (ESD) is affectionately referred to as what, by Irene?	The Fuzzy Guy
16	$(250 \times 4) + (4 \times 7) =$	10:28	What do we call the kind of screws that connect the cleaning head to the chassis (body) of the robot?	Captive screws—they don't fall out.
17	$2240 / 2 =$	11:20	Roomba has 3 stages of cleaning—which one is missing? Agitation, suction and...	Collection
18	$400 \times 3 =$	12:00	Why were the bristle brushes Roomba had before rollers a problem?	Like a hairbrush, they collected hair and needed to be cleaned
19	$5 \times 27 =$	13:50	How long can it take for the initial robot development?	Environmental, Temperature, Shake, rattle 'n roll, batter, cleaning performance, reliability or life testing, drop testing
20	$1164 + 75 =$	12:39	Name three types of testing that Roomba has to pass?	Three to four years just to de- sign and engineer a robot!