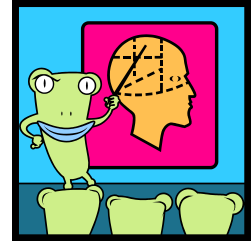


**SE TASK:**

# Alien Attack!



Aliens from the Outer Space Galactic Task Force have been watching the recent gains in mathematical understanding developing in human brains from Planet Earth. They have become alarmed that Planet Earth might soon develop the capabilities to discover that life exists on other planets with this increased mathematical knowledge. To slow the progress, they have organized an attack on the World Wide Web and all other forms of math textbooks. All words have been eradicated from the mathematics examples! Humans will now be forced to study the patterns of numbers and previously worked examples to rediscover the properties of mathematics! They are confident that humans will not persevere in the challenge of making sense of problems, reasoning abstractly and quantitatively, constructing viable arguments, looking for and making use of structure, and using repeated reasoning to recreate the language of mathematics. They have already declared MISSION ACCOMPLISHED!

The next standard in your mathematics class requires knowledge of the properties of integer exponents. Can your team recreate and name the properties by using the Standards for Mathematical Practice to examine the examples that remain?

*Problem continues on next page. →*

**Georgia Department of Education**  
Common Core Georgia Performance Standards Framework Student Edition  
*Eighth Grade Mathematics • Unit 2*

*Problem continued from previous page.*

<hr/> $7^3 \cdot 7^2 = (7 \cdot 7 \cdot 7) \cdot (7 \cdot 7) = 7^{3+2} = 7^5$ $5^3 \cdot 5^3 = (5 \cdot 5 \cdot 5) \cdot (5 \cdot 5 \cdot 5) = 5^{3+3} = 5^6$ $3 \cdot 3^4 = (3) \cdot (3 \cdot 3 \cdot 3 \cdot 3) = 3^5$	
<hr/> $(2^2)^3 = (2^2) \cdot (2^2) \cdot (2^2)$ $= (2 \cdot 2) \cdot (2 \cdot 2) \cdot (2 \cdot 2) = 2^{2 \cdot 3} = 2^6$ $(6^4)^2 = (6^4) \cdot (6^4)$ $= (6 \cdot 6 \cdot 6 \cdot 6) \cdot (6 \cdot 6 \cdot 6 \cdot 6) = 6^{4 \cdot 2} = 6^8$	
<hr/> $3^5 \cdot 2^5 = (3 \cdot 2)^5 = 6^5$ $4^3 \cdot 5^3 = (4 \cdot 5)^3 = 20^3$ $(2 \cdot 3)^6 = 2^6 \cdot 3^6$	

*Problem continues on next page. →*

*Problem continued from previous page.*

<hr/> $5^0 = 1$ $1^0 = 1$ $7000^0 = 1$	
<hr/> $2^{-2} = \frac{1}{2^2} = \frac{1}{4}$ $5^{-3} = \frac{1}{5^3} = \frac{1}{125}$	
<hr/> $\frac{5^5}{5^2} = 5^{5-2} = 5^3 = 125$ $\frac{2^3}{2^5} = 2^{3-5} = 2^{-2} = \frac{1}{2^2} = \frac{1}{4}$	