

6.2 The Natural Base e & Compounded Continuously CYU

Use when you get it right all by yourself
S Use when you did it all by yourself, but made a silly mistake
H Use when you could do it alone with a little help from teacher or peer
G Use when you completed the problem in a group
X Use when a question was attempted but wrong (get help)
N Use when a question was not even attempted

CONCEPTS	BASIC	INTERMEDIATE	ADVANCED
Simplifying expressions with the Euler Number	1, 3	2, 4	5
Error Analysis		6, 7	
Determining growth or decay with "e"	8 - 11		
Graphing exponentials with "e"		8 - 11	
Solving real-world scenarios of compounded continuously			

Simplify the expression. Show all work for full credit.

1. $e^5 \cdot e^3$ 2. $\frac{11e^9}{22e^{10}}$ 3. $(5e^{7x})^4$ 4. $\sqrt{9e^{6x}}$ 5. $e^x \cdot e^{-6x} \cdot e^8$

ERROR ANALYSIS Describe and correct the error in simplifying the expression.

6. X

$$(4e^{3x})^2 = 4e^{(3x)(2)}$$

$$= 4e^{6x}$$

7. X

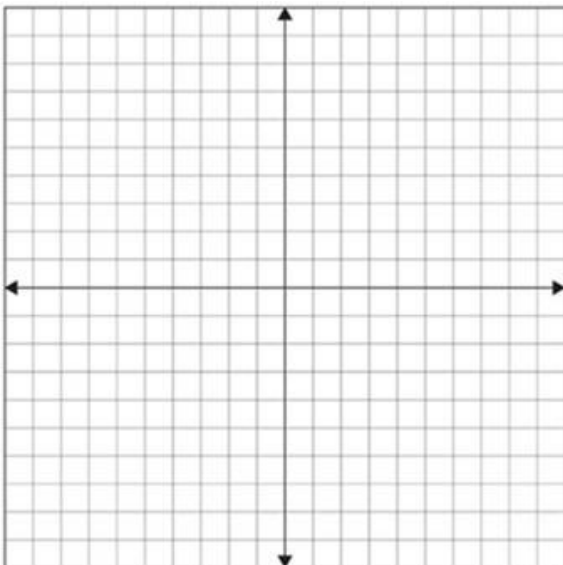
$$\frac{e^{5x}}{e^{-2x}} = e^{5x-2x}$$

$$= e^{3x}$$

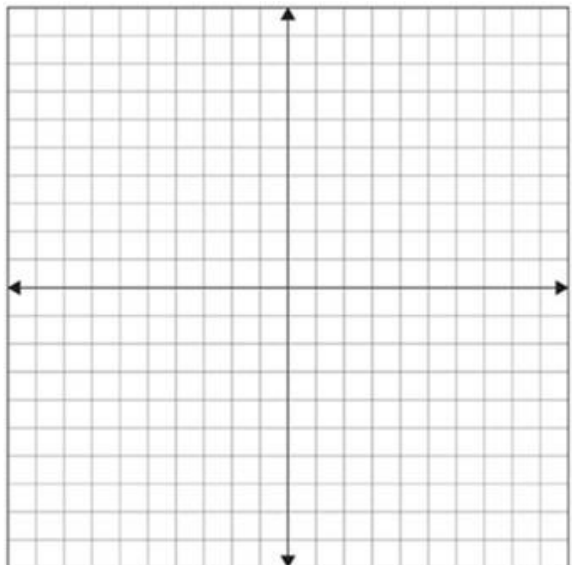
Tell whether the function represents exponential growth or exponential decay. Then graph the function.

HINT: create a t-chart using your calculator.

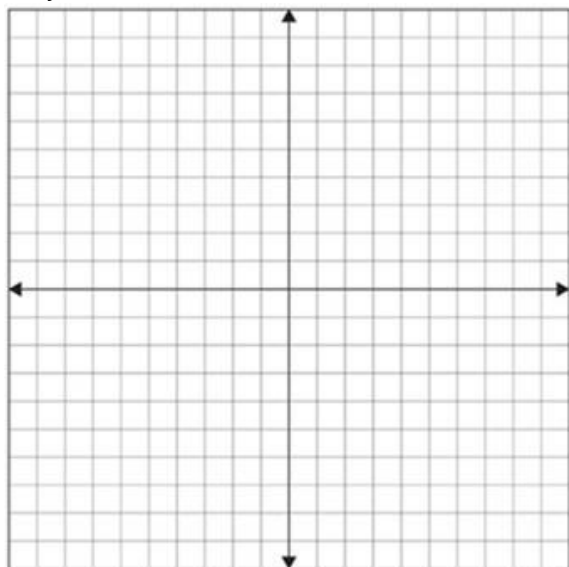
8. $y = e^{3x}$



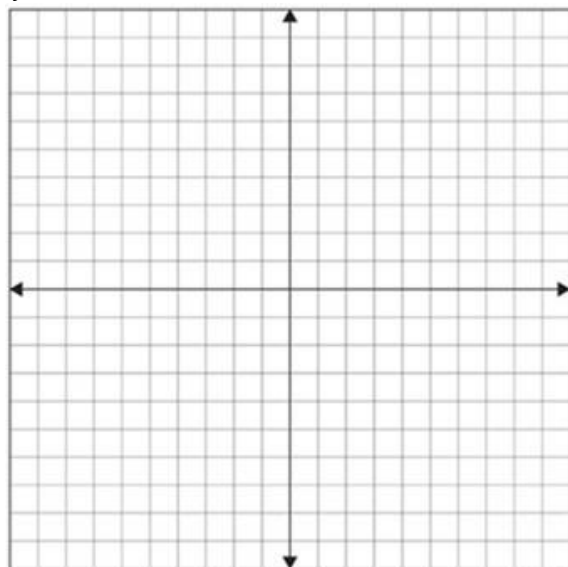
9. $y = 3e^{-2x}$



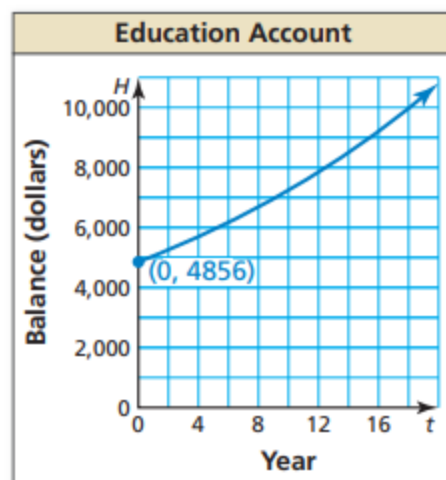
10. $y = 0.5e^x$



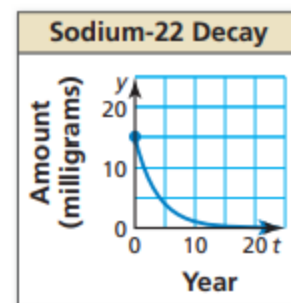
11. $y = 0.25e^{-3x}$



12. **MODELING WITH MATHEMATICS** Investment accounts for a house and education earn annual interest compounded continuously. The balance H (in dollars) of the house fund after t years can be modeled by $H = 3224e^{0.05t}$. The graph shows the balance in education fund over time. Which account has the greater principal? Which account has a greater balance after 10 years?



13. **MODELING WITH MATHEMATICS** Tritium and sodium-22 decay over time. In a sample of tritium, the amount y (in milligrams) remaining after t years is given by $y = 10e^{-0.0562t}$. The graph shows the amount of sodium-22 in a sample over time. Which sample started with a greater amount? Which has a greater amount after 10 years?



CYU Reflection: How far can you go: basic, intermediate, or advanced?

Rate your mastery level!

How confident are you with the skills this CYU covered? Circle the score you would give yourself.

