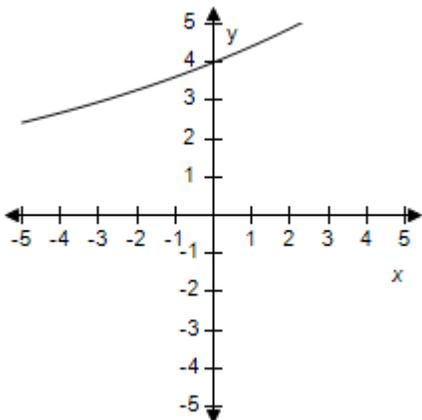


Section 3.5 - Exponential and Logarithmic Models

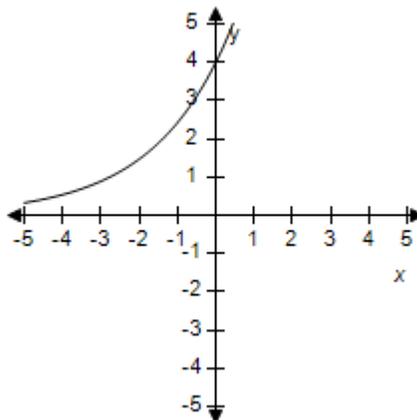
1. Select the correct graph for the given function.

$$y = 4e^{x/2}$$

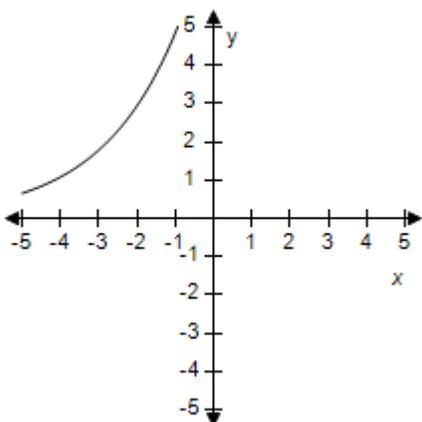
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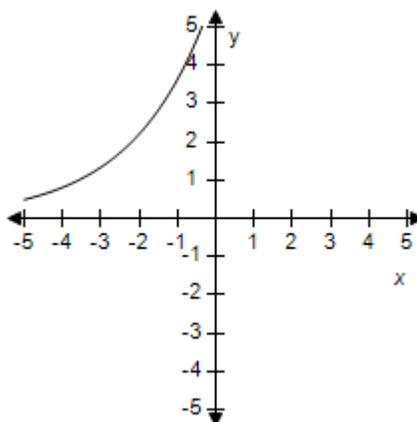
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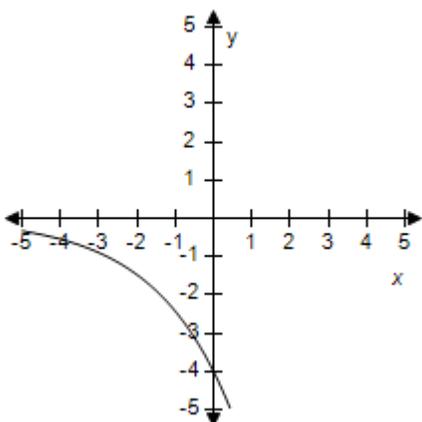
c.



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e.

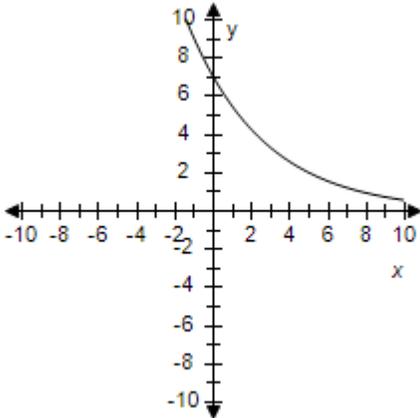


Section 3.5 - Exponential and Logarithmic Models

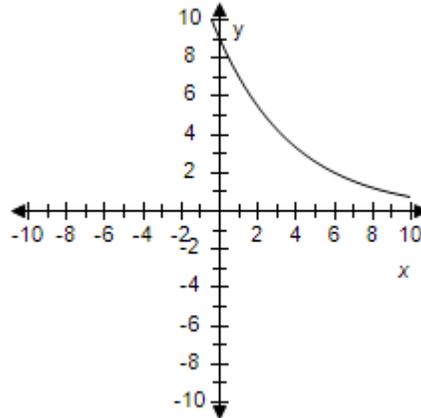
2. Select the correct graph for the given function.

$$y = 7e^{-x/4}$$

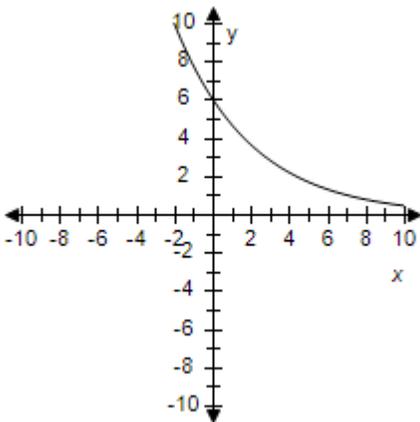
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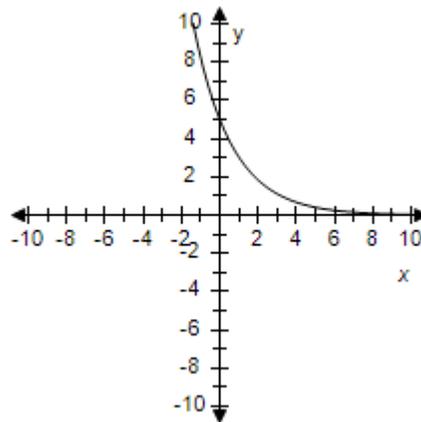
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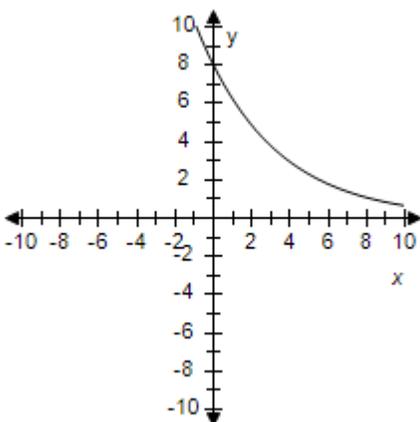
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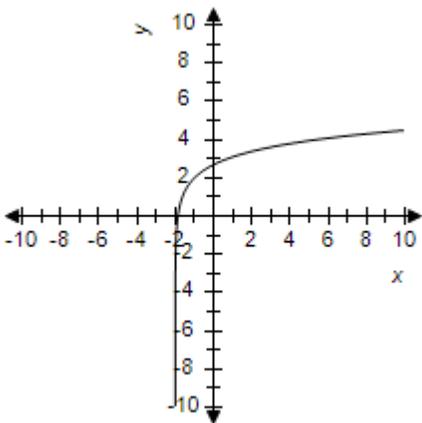


Section 3.5 - Exponential and Logarithmic Models

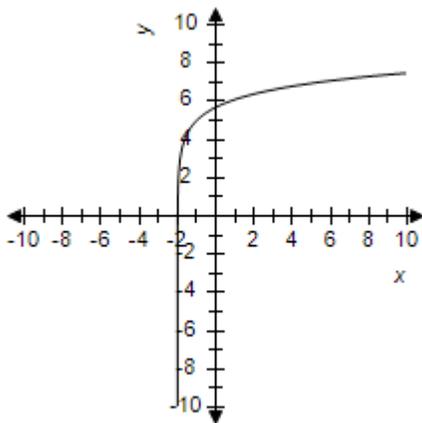
3. Select the correct graph for the given function.

$$y = 4 + \log(x + 2)$$

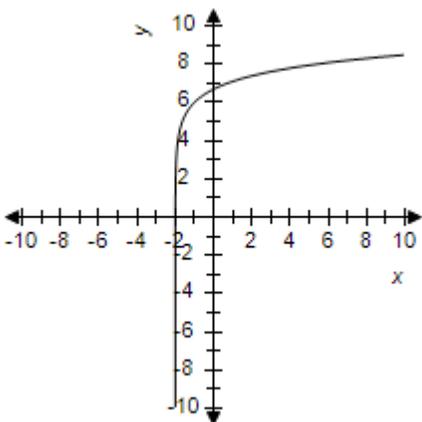
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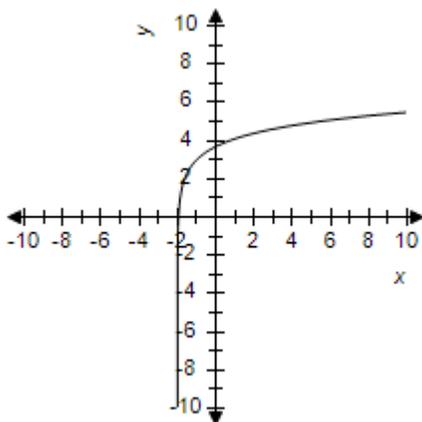
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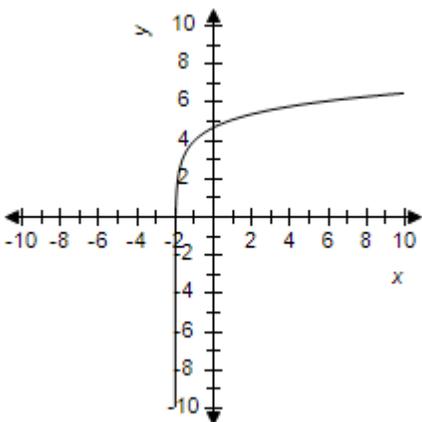
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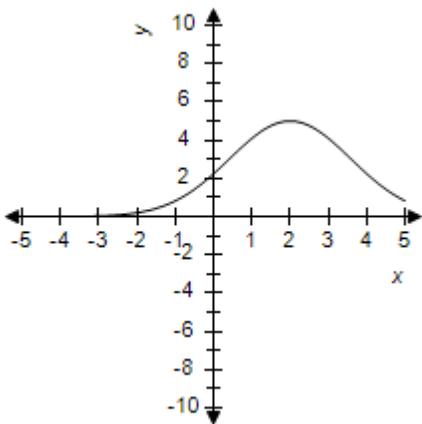


Section 3.5 - Exponential and Logarithmic Models

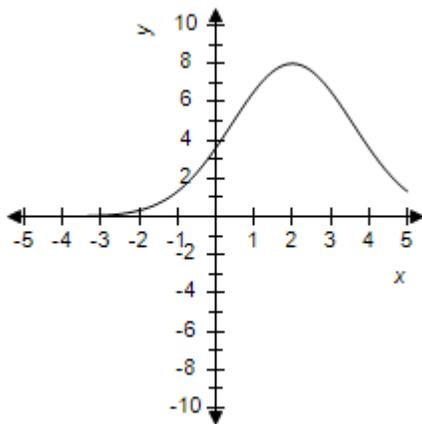
4. Select the correct graph for the given function.

$$y = 6e^{-(x-2)^2/5}$$

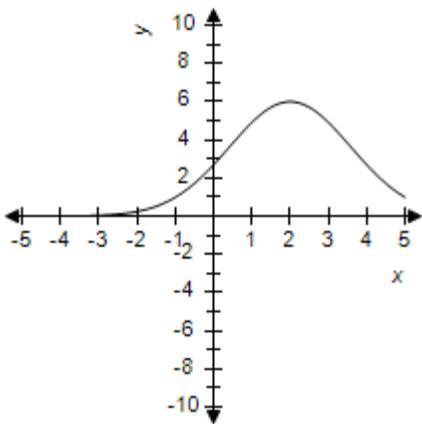
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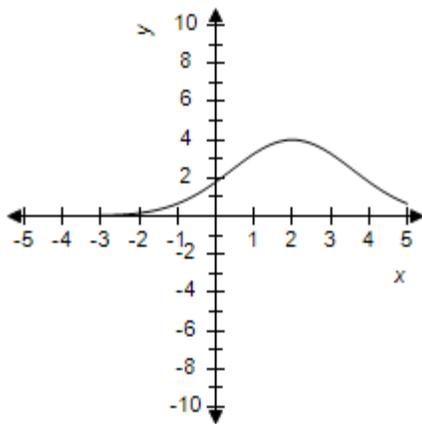
b.



c.

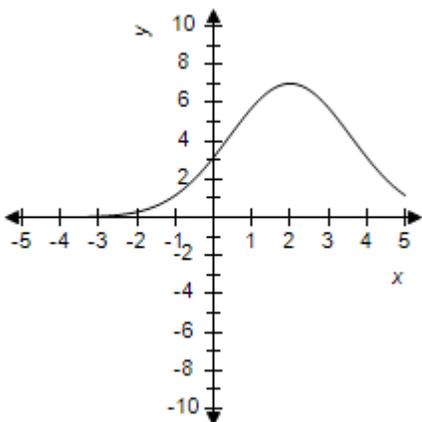


d.



e.

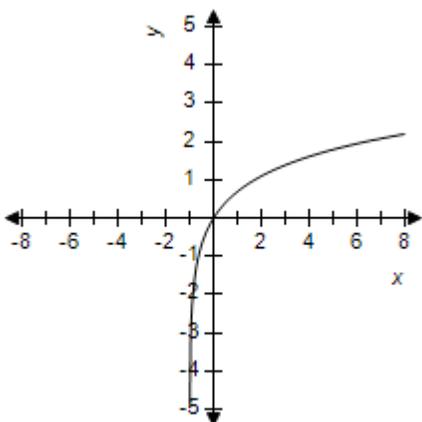
Section 3.5 - Exponential and Logarithmic Models



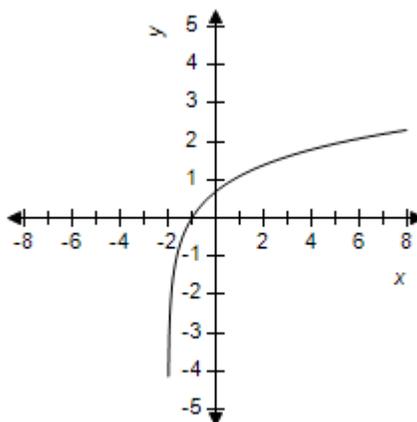
5. Select the correct graph for the given function

$y = \ln(x + 2)$

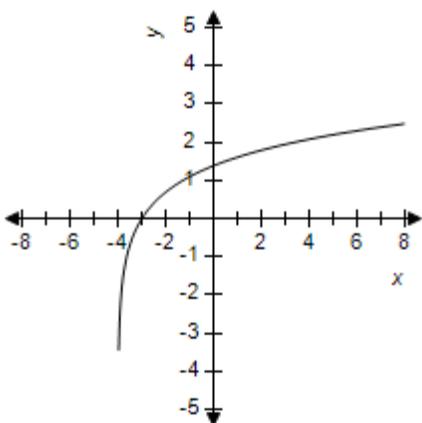
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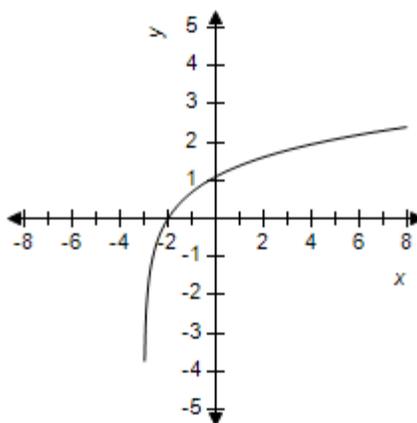
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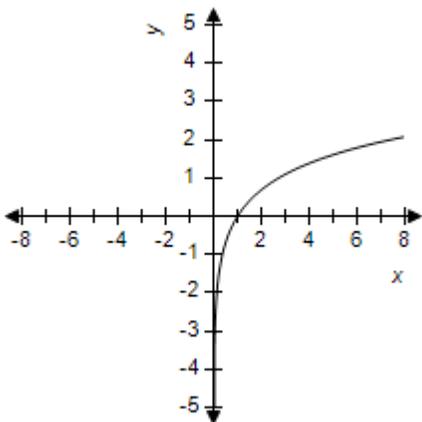


d.



Section 3.5 - Exponential and Logarithmic Models

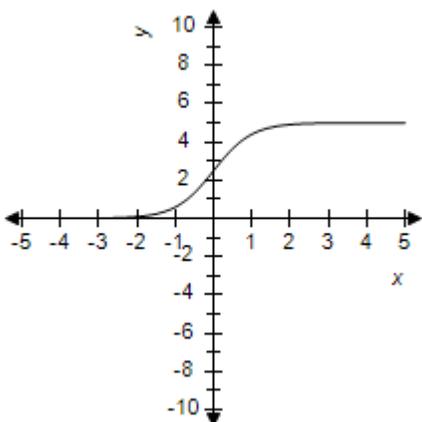
e.



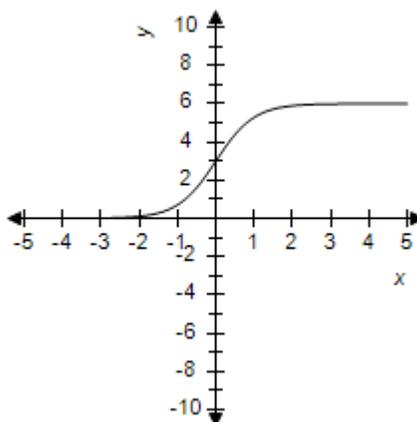
6. Select the correct graph for the given function

$$y = \frac{6}{1 + e^{-2x}}$$

a.



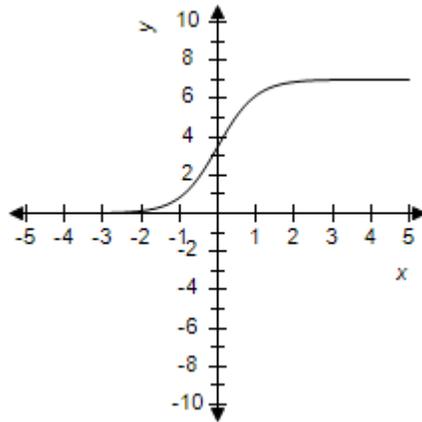
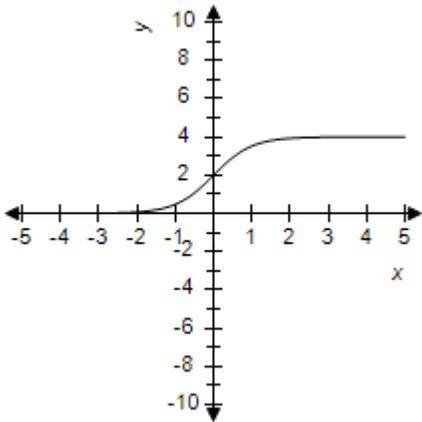
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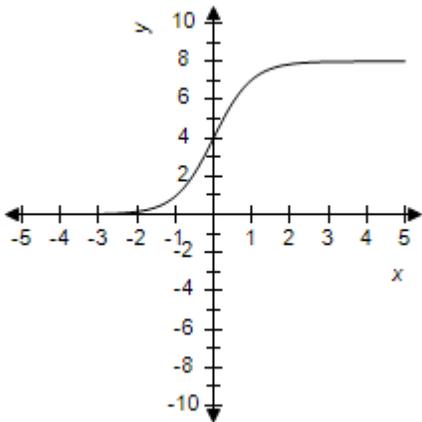
c.

d.

Section 3.5 - Exponential and Logarithmic Models



e.



7. Complete the table for a savings account in which interest is compounded continuously.

Initial investment	Annual % rate	Time to double	Amount after 10 years
\$1000	4.5%	----	----

(Round the time up to the nearest year. Round the amount to two decimal places.)

- a. Time to double: **16 yr**
Amount after 10 years: **\$2068.31**
- b. Time to double: **16 yr**
Amount after 10 years: **\$2568.31**
- c. Time to double: **21 yr**
Amount after 10 years: **\$1568.31**
- d. Time to double: **11 yr**
Amount after 10 years: **\$1568.31**
- e. Time to double: **16 yr**
Amount after 10 years: **\$1568.31**

Section 3.5 - Exponential and Logarithmic Models

8. An initial investment of \$4000 grows at an annual interest rate of 7% compounded continuously. How long will it take to double the investment? (Round the answer up to the nearest year.)

- a. 1 year
- b. 9 years
- c. 10 years
- d. 11 years
- e. 8 years

10. Complete the table for a savings account in which interest is compounded continuously.

Initial investment	Annual % rate	Time to double	Amount after 10 years
\$1000	---	$14\frac{3}{4}$ yr	----

(Round the answer to two decimal places.)

- a. Annual rate: **4.70%**
Amount after 10 years: **\$1599.99**
- b. Annual rate: **8.70%**
Amount after 10 years: **\$1599.99**
- c. Annual rate: **4.70%**
Amount after 10 years: **\$1099.99**
- d. Annual rate: **4.70%**
Amount after 10 years: **\$2099.99**
- e. Annual rate: **6.70%**
Amount after 10 years: **\$1599.99**

11. An initial investment of \$3000 doubles in value in 10.0 years. Assuming continuous compounding, what was the interest rate? (Round the answer to the nearest tenth of a percent.)

- a. 6.9%
- b. 3.0%
- c. 3.5%
- d. 10.0%
- e. 100%

15. Complete the table for a savings account in which interest is compounded continuously.

Initial investment	Annual rate	Time to double	Amount after 10 years
\$11,000	---	---	\$19,607.17

Section 3.5 - Exponential and Logarithmic Models

(Round the rate to two decimal places. Round the time to the nearest year.)

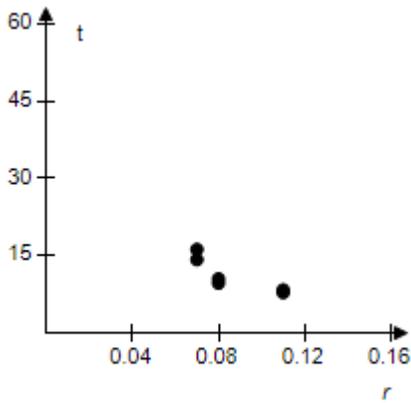
- a. Annual rate: ~~7%~~ **7.78%**
Time to double: 12 yr
- b. Annual rate: ~~5.78%~~ **5.78%**
Time to double: 15 yr
- c. Annual rate: ~~9.78%~~ **9.78%**
Time to double: 12 yr
- d. Annual rate: ~~5.78%~~ **5.78%**
Time to double: 14 yr
- e. Annual rate: ~~5.78%~~ **5.78%**
Time to double: 12 yr

21. Select a scatter plot of the given data.

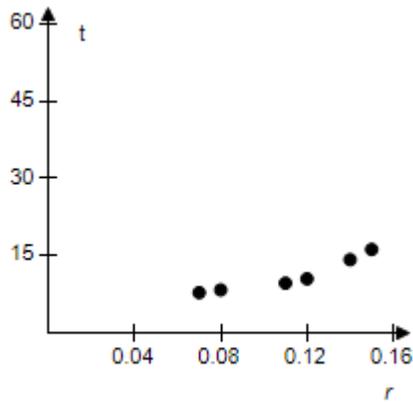
r	7%	8%	11%	12%	14%	15%
t	16.24	14.27	10.53	9.69	8.38	7.86

Section 3.5 - Exponential and Logarithmic Models

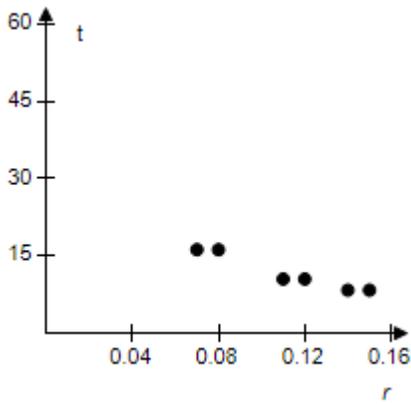
a.



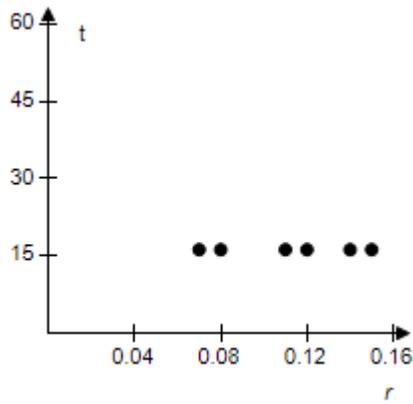
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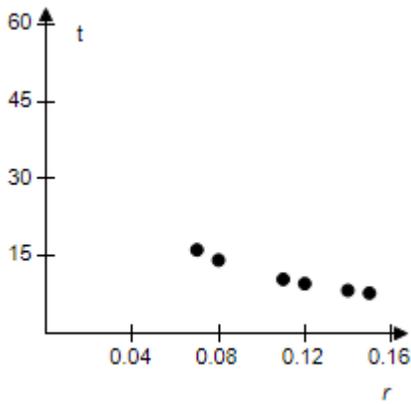
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d.



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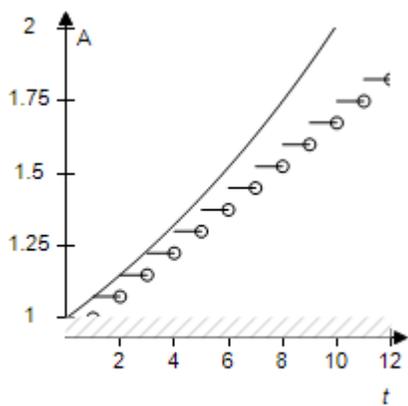


24. If \$1 is invested in an account over a 9-year period, the amount in the account, where t represents the time in years, is given by $A = 1 + 0.075[[t]]$ or $A = e^{0.07t}$ depending on whether the account pays simple interest at $7\frac{1}{2}\%$ or continuous compound interest at 7%. Graph each function on the same set of axes. Which grows at a

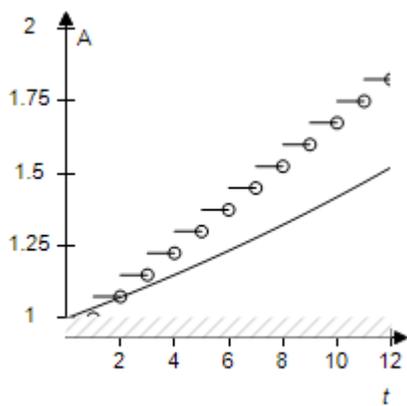
Section 3.5 - Exponential and Logarithmic Models

higher rate?

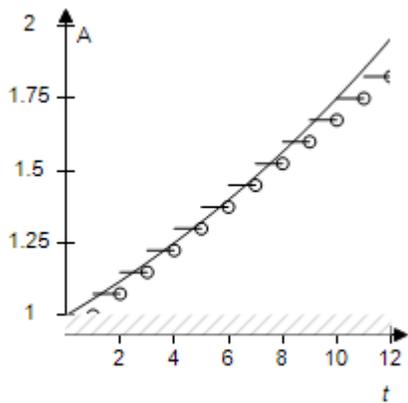
a.



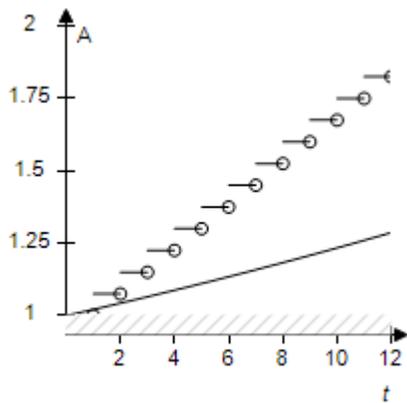
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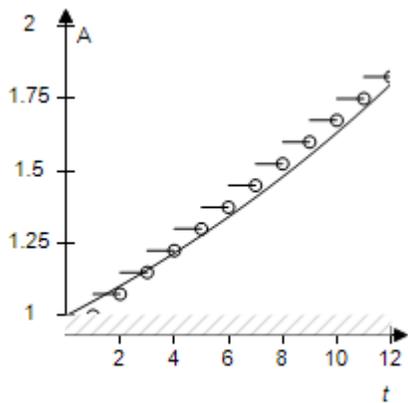
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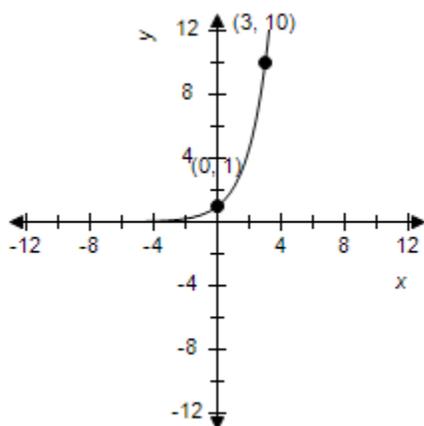
25. Complete the table for the radioactive isotope. Round your answer to two decimal places.

Isotope	Half-life (years)	Initial Quantity	Amount after 1000 years
^{226}Ra	1599	5g	----

Section 3.5 - Exponential and Logarithmic Models

- a. Amount after 1000 years: $5.24g$
- b. Amount after 1000 years: $7.24g$
- c. Amount after 1000 years: $3.24g$
- d. Amount after 1000 years: $6.24g$
- e. Amount after 1000 years: $4.24g$

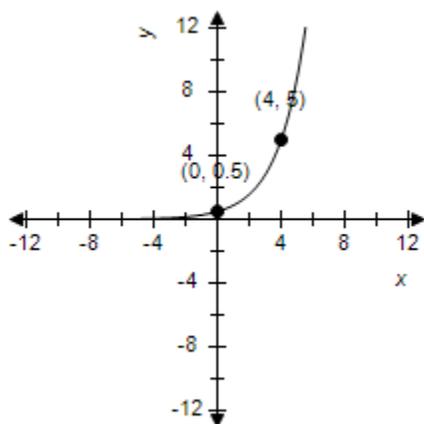
31. Find the exponential model $y = ae^{0.7675x}$ that fits the points shown in the graph.



- a. $y = e^{-0.7675x}$
- b. $y = e^{0.7675x}$
- c. $y = -e^{-0.7675x}$
- d. $y = xe^{0.7675}$
- e. $y = -xe^{-0.7675}$

32. Find the exponential model $y = ae^{0.5756x}$ that fits the points shown in the graph.

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- a. $y = \frac{1}{2}e^{-0.5756x}$
- b. $y = -\frac{1}{2}xe^{-0.5756}$
- c. $y = \frac{1}{2}xe^{0.5756}$
- d. $y = \frac{1}{2}e^{0.5756x}$
- e. $y = -\frac{1}{2}e^{-0.5756x}$

37. The value V (in millions of dollars) of a famous painting can be modeled by $V = 10e^{kt}$ where t represents the year, with $t = 0$ corresponding to 2000. In 2008, the same painting was sold for \$65 million. Predict the value of the painting in 2018. (Round your answer to two decimal places.)

- a. \$674.61 million
- b. \$874.61 million
- c. \$624.61 million
- d. \$774.61 million
- e. \$574.61 million

52. Carbon dating presumes that, as long as a plant or animal is alive, the proportion of its carbon that is ^{14}C is

Section 3.5 - Exponential and Logarithmic Models

constant. The amount of ^{14}C in an object made from harvested plants, like paper, will decline exponentially according to the equation $A = A_0 e^{-0.0001213t}$, where A represents the amount of ^{14}C in the object, A_0 represents the amount of ^{14}C in living organisms, and t is the time in years since the plant was harvested. If an archeological artifact has 20% as much ^{14}C as a living organism, how old would you predict it to be? Round the answer to the nearest year.

- a. 24,697 years
- b. 5,715 years
- c. 13,268 years
- d. 12,998 years
- e. 115 years