

3. [-/1 Points]

DETAILS

Solve the equation. (Enter your answers as a comma-separated list.)

$$2^{-100x} = (0.5)^{x-4}$$

x =

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4. [-/1 Points]

DETAILS

Solve the equation. (Enter your answers as a comma-separated list.)

$$9^{x-7} = 27^{4-x}$$

x =

Need Help?

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5. [-/1 Points]

DETAILS

Solve the equation. (Enter your answers as a comma-separated list.)

$$16^{10x} \cdot \left(\frac{1}{4}\right)^{7x+2} = 64 \cdot (4^2)^{-5}$$

x =

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6. [1/1 Points]

DETAILS

PREVIOUS ANSWERS

19. [-/1 Points] DETAILS MY NOTES

The half-life of radium is 1600 years. If the initial amount is q_0 milligrams, then the quantity $q(t)$ remaining after t years is given by $q(t) = q_0 2^{kt}$. Find k .

$k =$

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20. [-/4 Points] DETAILS MY NOTES PRACTICE ANOTHER

Suppose \$1000 is invested at a rate of 5% per year compounded monthly. (Round your answers to the nearest cent.)

(a) Find the principal after 1 month.
\$

(b) Find the principal after 6 months.
\$

(c) Find the principal after 1 year.
\$

(d) Find the principal after 20 years.
\$

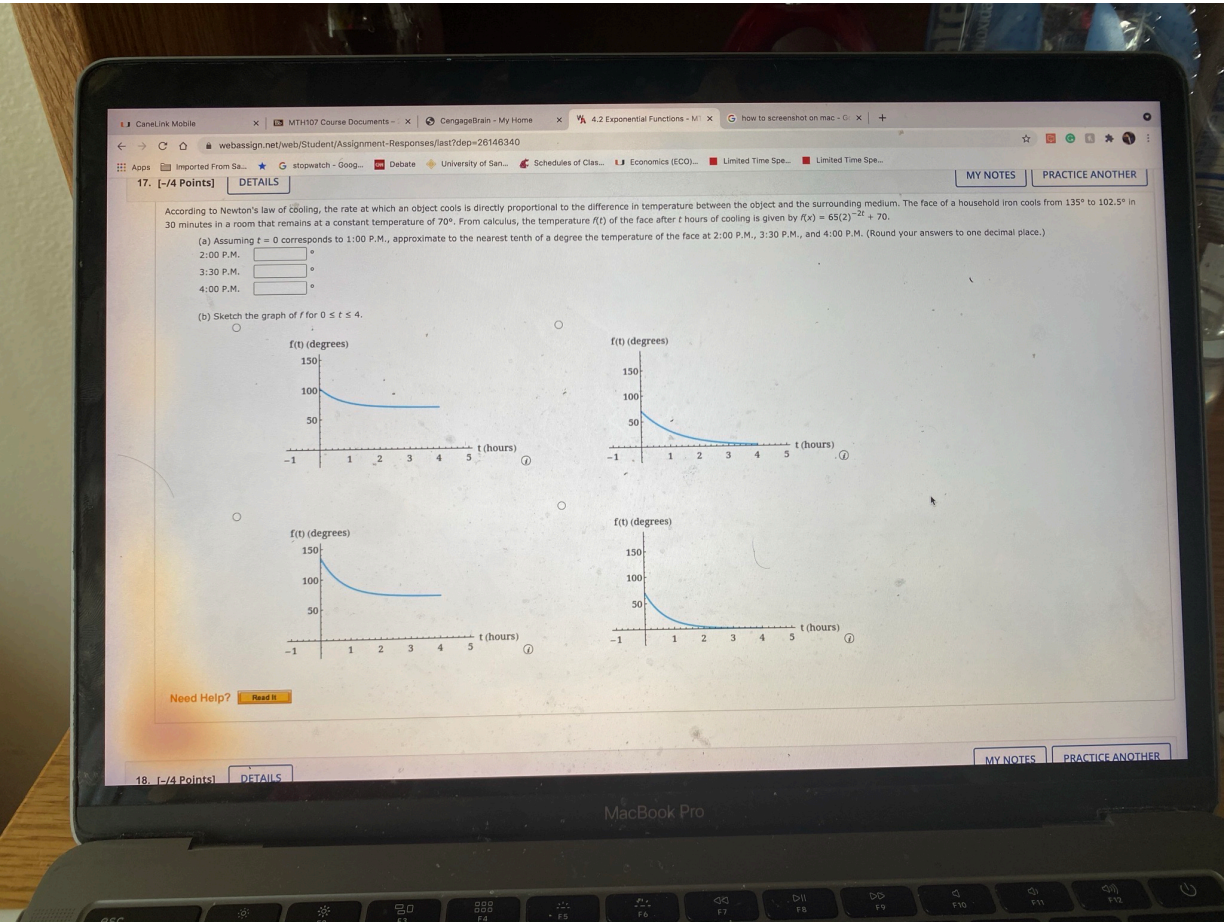
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21. [-/1 Points] DETAILS MY NOTES PRACTICE ANOTHER

If a savings fund pays interest at a rate of 2% per year compounded semiannually, how much money invested now will amount to \$8000 after 1 year? (Round your answer to the nearest cent.)

\$

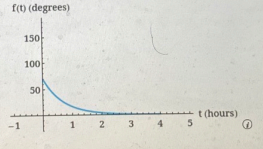
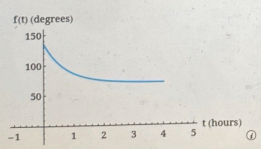
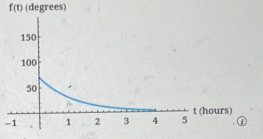
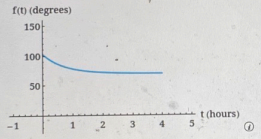
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According to Newton's law of cooling, the rate at which an object cools is directly proportional to the difference in temperature between the object and the surrounding medium. The face of a household iron cools from 135° to 102.5° in 30 minutes in a room that remains at a constant temperature of 70° . From calculus, the temperature $f(t)$ of the face after t hours of cooling is given by $f(t) = 65(2)^{-2t} + 70$.

- (a) Assuming $t = 0$ corresponds to 1:00 P.M., approximate to the nearest tenth of a degree the temperature of the face at 2:00 P.M., 3:30 P.M., and 4:00 P.M. (Round your answers to one decimal place.)
- 2:00 P.M.
- 3:30 P.M.
- 4:00 P.M.

(b) Sketch the graph of f for $0 \leq t \leq 4$.



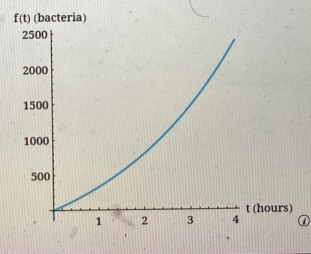
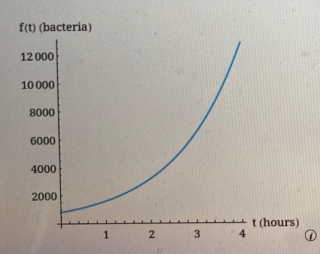
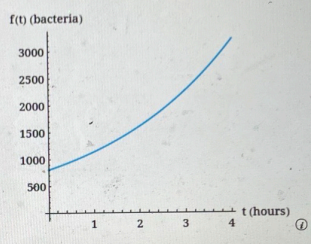
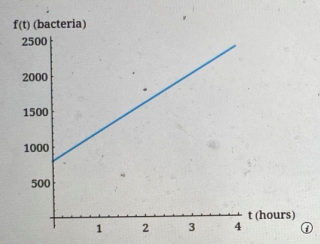
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16. [-/4 Points] DETAILS

The number of bacteria in a certain culture increased from 800 to 1600 between 7:00 A.M. and 9:00 A.M. Assuming growth is exponential, the number $f(t)$ of bacteria t hours after 7:00 A.M. is given by $f(t) = 800(2)^{t/2}$.

- (a) Estimate the number of bacteria in the culture at 8:00 A.M., 10:00 A.M., and 11:00 A.M. (Round your answers to the nearest whole number.)
- 8:00 A.M. bacteria
- 10:00 A.M. bacteria
- 11:00 A.M. bacteria

(b) Sketch the graph of f for $0 \leq t \leq 4$.



12. [-/1 Points] DETAILS

Find an exponential function of the form $f(x) = ba^x$ that has the given y -intercept and passes through the point P .

y -intercept 9; $P(2, 1)$

$f(x) =$

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13. [-/1 Points] DETAILS

Find an exponential function of the form $f(x) = ba^{-x} + c$ that has the given horizontal asymptote and y -intercept and passes through point P .

$y = 28$; y -intercept 528; $P(2, 108)$

$f(x) =$

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14. [-/2 Points] DETAILS

One hundred elk, each 1 year old, are introduced into a game preserve. The number $N(t)$ alive after t years is predicted to be $N(t) = 100(0.7)^t$.

(a) Estimate the number alive after 7 years. (Round your answer to the nearest whole number.)

elk

(b) What percentage of the herd dies each year?

%

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15. [-/2 Points] DETAILS

A drug is eliminated from the body through urine. Suppose that for an initial dose of 30 milligrams, the amount $A(t)$ in the body t hours later is given by $A(t) = 30(0.8)^t$.

(a) Estimate the amount of the drug in the body 8 hours after the initial dose. (Round your answer to two decimal places.)

mg

(b) What percentage of the drug still in the body is eliminated each hour?

%

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