Solving Exponential Equations II (7.3)

p364 day 5

take up quiz 10

Quiz 10C

1. Solve on $[0,2\pi)$: $\sin 2x + \cos x = 0$

2. Solve on $x \in \mathbb{R}$: $2\cos^2 x + 3\sin x = 3$

3. Ac-225 has a half-life of 10 days. How much of a 500g sample remains after 50 days?

4. Graph $y = 3(2)^{x-4} - 2$

5. If $\tan A = \frac{5}{12}$, find the values of A on $[0,2\pi)$

6. Evaluate: $\cos\frac{\pi}{6}\cos\frac{\pi}{3} - \sin\frac{\pi}{6}\sin\frac{\pi}{3}$

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8. If seafood is not kept frozen (below 0 °C), it will spoil due to bacterial growth. The relative rate of spoilage increases with temperature according to the model $R = 100(2.7)^{\frac{T}{8}}$, where T is the temperature, in degrees Celsius, and R is the relative spoilage rate.
   a) Sketch a graph of the relative spoilage rate R versus the temperature T from 0 °C to 25 °C.
   b) Use your graph to predict the temperature at which the relative spoilage rate doubles to 200.
   c) What is the relative spoilage rate at 15 °C?
   d) If the maximum acceptable relative spoilage rate is 500, what is the maximum storage temperature?

4cd, 5cd, 8, 10

$200 = 100(2.7)^{\frac{T}{8}}$

10. Simionie needs $7(snowmobile, but o offers a GIC that pa rate of 3.93%, com long would Simion money in the GIC t to buy the snowmo

Christmas music quiz

Project 5

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ex1: A culture of E-coli has 2000 bacteria. Two and a half hours later there are 2 048 000 bacteria. What is the doubling period?

$P(t) = P_0(2)^{\frac{t}{d}}$ ← doubling period

$\div 2000$ $2048000 = 2000 \cdot 2^{\frac{2.5}{d}}$

$1024 = 2^{\frac{2.5}{d}}$

$2^{10} = 2^{\frac{2.5}{d}}$

$\therefore 10 = \frac{2.5}{d}$

$d = 0.25$

always 2 for bacteria

∴ 15 minutes

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ex2: You borrow $10,000 to get through first year. If the interest is 7% compounded semi-annually, how much will you owe in 4 years time?

$A = 10000(1.07)^4$

$= 10000(1.035)^8$

$= \$13168$

$1 + \frac{0.07}{2}$

Amount

Principal

interest rate

compounds / year

number of years

$$A = P\left(1 + \frac{i}{c}\right)^{n \cdot c}$$

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ex3: How much will you have if you invest $3000 for 9 years at 5% compounded quarterly?

$A = P(1 + \frac{i}{c})^{n \cdot c}$

$= 3000(1 + \frac{0.05}{4})^{9.4}$

$= \$4692$

try: \$6200 at 3% for 10 years compounded monthly

$A = 6200(1 + \frac{0.03}{12})^{12 \cdot 10}$

$= \$8366$

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ex4: You bought a new car that cost \$24,000. It depreciates at 16% per year. What will the car be worth in 5 years?

$A = 24000(1 - 0.16)^5$

$= 24000(0.84)^5$

$= \$10,037$

Compare after 10 years

\$4197

Solving Exponential Equations II (7.3) p364 day 5

hw: p364 #9, 11, 13