Lecture 35: Review for exam 3

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Image: A matrix and a matrix

Question 1.

An angle cuts out 2/3 of a circle. Give the positive radian measure of the angle.

A 2/3 B $2\pi/3$ C $\pi/3$ D $4\pi/3$ E 4/3

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Question 1.

An angle cuts out 2/3 of a circle. Give the positive radian measure of the angle.

A 2/3 B $2\pi/3$ C $\pi/3$ D $4\pi/3$ E 4/3 A full circle is 2π radians, so 2/3 of a circle will be $\frac{2}{3}2\pi = 4\pi/3$ radians.

Question 2.

Suppose that a population doubles every six hours and we have 100 critters at time t = 0. Which function models the population after t hours? There is more than one correct answer.

A
$$P(t) = 6 \cdot 2^{-100t}$$

B $P(t) = 100 \cdot 2^{-6t}$
C $P(t) = 100 \cdot 2^{6t}$
D $P(t) = 100 \cdot e^{t \ln(2)/6}$
E $P(t) = 100 \cdot 2^{t/6}$

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Thus, E is correct. We also have that $100 \cdot e^{t \ln(2)/6} = (e^{\ln(2)})^{t/6} = 100 \cdot 2^{t/6}$. Thus D is also a correct answer.

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Question 3.

Find the phase shift for the function $f(x) = \sin(2x + 1)$.

A 1 B -1 C 2 D -2 E -1/2

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Question 3.

Find the phase shift for the function $f(x) = \sin(2x + 1)$.

A 1 B -1 C 2 D -2 E -1/2

The phase shift is the *x*-coordinate where the sine wave starts. Since sin(2x + 1) = sin(2(x + 1/2)) is graph of sin(2x) shifted 1/2 unit to the left, we have that the phase shift for this function is -1/2.

Question 4.

If we divide both sides of the identity $\sin^2(x) + \cos^2(x) = 1$ by $\sin(x)$, we obtain the following identity

A
$$sin(x) + cos(x) cot(x) = csc(x)$$

B $sin(x) + cos(x) tan(x) = csc(x)$
C $sin(x) + cot^2(x) = csc(x)$
D $sin(x) + cos(x) cot(x) = sec(x)$
E $1 + cot^2(x) = csc^2(x)$

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