Bellwork Alg 2 Thursday, April 2, 2020

1. Use these formulas: $y = P\left(1 + \frac{r}{n}\right)^{nt}$ $y = Pe^{rt}$

You invest $10,000 in an account that pays 9% annual interest. Find the amount of money(to the nearest hundredth) you'll have after 20 years if interest is calculated the following ways:

a) Compounded Continuously

b) Compounded monthly

2. Use the Unit Circle to find the EXACT value of each. Give answers in simplified radical form with rationalized denominators.

a) $\sin\left(\frac{-23\pi}{6}\right)$

b) $\tan\frac{19\pi}{3}$

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ANSWERS

1. Use these formulas: $y = P\left(1 + \frac{r}{n}\right)^{nt}$ $y = Pe^{rt}$

You invest $10,000 in an account that pays 9% annual interest. Find the amount of money(to the nearest hundredth) you'll have after 20 years if interest is calculated the following ways:

a) Compounded Continuously

use ~~A=P~~ $y = Pe^{rt}$

$P = \$10{,}000$

$r = 9\% \rightarrow 0.09$

$t = 20$

$y = (10{,}000)e^{(.09)(20)}$

$= \$60{,}496.47$

b) Compounded monthly

use $y = P\left(1 + \frac{r}{n}\right)^{nt}$

$P = \#10{,}000$ $r = 9\% \rightarrow 0.09$

$n = 12$ $t = 20$

$y = (10{,}000)\left(1 + \frac{.09}{12}\right)^{(12)(20)}$

$= \#60{,}091.52$

2. Use the Unit Circle to find the EXACT value of each. Give answers in simplified radical form with rationalized denominators.

a) $\sin\left(\frac{-23\pi}{6}\right)$ $2\pi = \frac{12\pi}{6}$

- 1ST find coterminal angle on the Unit Circle

$-\frac{23\pi}{6} + \frac{12\pi}{6} = -\frac{11\pi}{6}$

$-\frac{11\pi}{6} + \frac{12\pi}{6} = \frac{\pi}{6}$

$\sin\left(\frac{-23\pi}{6}\right) = \sin\frac{\pi}{6} = y\text{-coord at } \frac{\pi}{6}$

$\sin\left(\frac{-23\pi}{6}\right) = 1/2$

b) $\tan\frac{19\pi}{3}$ $2\pi = \frac{6\pi}{3}$

- 1ST find coterminal $\angle$ on Unit Circle

$\frac{19\pi}{3} - \frac{6\pi}{3} = \frac{13\pi}{3}$

$\frac{13\pi}{3} - \frac{6\pi}{3} = \frac{7\pi}{3}$

$\frac{7\pi}{3} - \frac{6\pi}{3} = \frac{\pi}{3}$

$\tan\frac{19\pi}{3} = \tan\frac{\pi}{3} = \frac{Y}{X} \text{ at } \frac{\pi}{3}$

$= \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \sqrt{3}$

$\tan\frac{19\pi}{3} = \sqrt{3}$