

Algebra 2 quick quiz 03092023

Question 1.

The temperature, in degrees Fahrenheit, in Times Square during a day in August can be predicted by the function $T(x) = 8\sin(0.3x - 3) + 74$, where x is the number of hours after midnight. According to this model, the predicted temperature, to the *nearest degree* Fahrenheit, at 7 P.M. is

- (1) 68
- (2) 74
- (3) 77
- (4) 81

Question 2.

Consider the system of equations below:

$$\begin{aligned}x + y - z &= 6 \\2x - 3y + 2z &= -19 \\-x + 4y - z &= 17\end{aligned}$$

Which number is *not* the value of any variable in the solution of the system?

- (1) -1
- (2) 2
- (3) 3
- (4) -4

Question 3.

Camryn puts \$400 into a savings account that earns 6% annually. The amount in her account can be modeled by $C(t) = 400(1.06)^t$ where t is the time in years. Which expression best approximates the amount of money in her account using a weekly growth rate?

- (1) $400(1.001153846)^t$
- (2) $400(1.001121184)^t$
- (3) $400(1.001153846)^{52t}$
- (4) $400(1.001121184)^{52t}$

Question 4.

The table below shows the number of hours of daylight on the first day of each month in Rochester, NY.

Month	Hours of Daylight
Jan.	9.4
Feb.	10.6
March	11.9
April	13.9
May	14.7
June	15.4
July	15.1
Aug.	13.9
Sept.	12.5
Oct.	11.1
Nov.	9.7
Dec.	9.0

Given the data, what is the average rate of change in hours of daylight per month from January 1st to April 1st?

Interpret what this means in the context of the problem.

Question 5. Use an additional sheet of paper to explain /show how you got your answer.

Algebraically solve for x :

$$\frac{7}{2x} - \frac{2}{x+1} = \frac{1}{4}$$

Question 6. Use an additional sheet of paper to explain /show how you got your answer.

Kenzie believes that for $x \geq 0$, the expression $(\sqrt[7]{x^2})(\sqrt[5]{x^3})$ is equivalent to $\sqrt[35]{x^6}$. Is she correct? Justify your response algebraically.

Question 7. Use an additional sheet of paper to explain /show how you got your answer.

When the function $p(x)$ is divided by $x - 1$ the quotient is $x^2 + 7 + \frac{5}{x - 1}$. State $p(x)$ in standard form.

Question 8.

Write a recursive formula for the sequence 6, 9, 13.5, 20.25, . . .

Question 9. Use an additional sheet of paper to explain /show how you got your answer.

Factor completely over the set of integers: $16x^4 - 81$

Sara graphed the polynomial $y = 16x^4 - 81$ and stated "All the roots of $y = 16x^4 - 81$ are real." Is Sara correct? Explain your reasoning.

Question 10.

Determine an equation for the parabola with focus $(4, -1)$ and directrix $y = -5$.
(Use of the grid below is optional.)

Bonus Question

Question 11. Use an additional sheet of paper to explain /show how you got your answer.

The half-life of a radioactive substance is 15 years.

Write an equation that can be used to determine the amount, $s(t)$, of 200 grams of this substance that remains after t years.

Determine algebraically, to the *nearest year*, how long it will take for $\frac{1}{10}$ of this substance to remain.