

ALGEBRA 2 BOWL QUESTIONS

Algebra Two Team Question # 1

A ball is dropped onto concrete from a height of 9 ft. Each time it hits the concrete it rebounds to two-thirds the height from which it fell. Find the total distance, in feet, this bouncing ball travels.

Algebra Two Team Question # 2

A quadratic function, $f(x) = ax^2 + bx + c$, exists such that the maximum value of $f(x)$ is 8 and the graph of $f(x)$ has x-intercepts of 3 and 7.
FIND $a+b+c$.

Algebra Two Team Question # 3

Solve and write your answer in INTERVAL notation.

$$-3 \leq \left| \frac{3x-5}{2} \right| \leq 5$$

Algebra Two Team Question # 4

Two cousins, Olivia and Isabelle, wave as they depart from grandma's house and travel in opposite directions on an interstate highway. Olivia (exceeding the legal limit) travels 8 mph faster than Isabelle. After 2 hours they are 224 miles apart.

Let A = Isabelle's speed in mph

Let B = Olivia's speed in mph

Let C = the number of miles they will be from each other after 3 hours if their speeds remain the same.

Find $C - 2(A+B)$

Algebra Two Team Question # 5

Find ALL linear factors of $f(x) = x^4 - 2x^3 - 5x^2 + 4x + 6$.

Algebra Two Team Question # 6

$$A = \begin{bmatrix} 5 & 3 \\ 3 & 2 \end{bmatrix}$$

$$B = A^{-1} \quad \text{Find } B \times C.$$

$$C = A^2$$

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Algebra Two Team Question # 7

Let $A = (-2i)^9 - 13i^{61}$

$B = (1 + i)^{18}$

$C = (2 + 3i)(1 - 2i)$

where $i = \sqrt{-1}$.FIND $A + B - C$ Algebra Two Team Question # 8Solve for (x, y) .

$$\frac{4}{x} - \frac{9}{y} = 48$$

$$\frac{5}{x} + \frac{13}{y} = -37$$

Algebra Two Team Question # 9If $f(x) = \frac{3x+5}{2x-1}$, andLet $y = A$ be the horizontal asymptote of $f(x)$.Let $x = B$ be the vertical asymptote of $f(x)$.Let C = the x-intercept of $f(x)$.FIND $A + 2B - 3C$ Algebra Two Team Question # 10Given: $y^2 = 3x^2 + 12$

A = the square of the positive y-intercept.

B = the square of the positive slope of the asymptotes.

C = x-coordinate of the foci.

D = the square of the value of y when $x = 1$.FIND: $AB - CD$ Algebra Two Team Question # 11Samantha has taken a job with a starting salary of \$44,000. Find her salary during her 3rd year on the job if she receives a 5% annual raise.

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Algebra Two Team Question # 12

A vending machine takes quarters and dimes but gives out change in nickels and dimes. The selections chosen by customers usually result in four times as many nickels as dimes being used in change. How many of each coin should be placed in the change hoppers by the vendor, if he is putting \$45 in change in the machine? **Answer should be: (nickels, dimes)**

Algebra Two Team Question # 13

The real solutions of the system of equations below are in the form: (x,y).

$$x^2 + y^2 = 25$$

$$x^2 - y^2 = 7$$

Find A – B; where

A = sum of all POSITIVE abscissas and

B = sum of all NEGATIVE ordinates

of the solutions.

Algebra Two Team Question # 14

The longest side of a triangle is 12 less than the sum of the other two sides. The shortest side is 10 more than one-half the third side. If the perimeter is 188, find each side and write the lengths in increasing order.

Algebra Two Team Question # 15

$$A = \begin{bmatrix} 2 & 7 & -6 \\ 0 & 1 & 5 \\ -2 & 1 & 11 \end{bmatrix}, \quad B = \begin{bmatrix} 6 & -5 \\ \frac{3}{5} & 8 \end{bmatrix} \quad \text{FIND } (\det A)(B^{-1})$$