

Infinite geometric series:

Bounces Down  $a_{\infty} = \frac{9}{1 - \frac{2}{3}}$  + Bounces Up  $a_{\infty} = \frac{6}{1 - \frac{2}{3}}$

Ball traveled  $27 + 18 =$  ;**45 feet.**

Algebra Two Team Question # 2

x- coordinate of Vertex:  $\frac{3+7}{2} = 5.$

Points: (3,0)->  $0 = a(3)^2 + b(3) + c$

(7,0)->  $0 = a(7)^2 + b(7) + c$

(5,8)->  $8 = a(5)^2 + b(5) + c$

Solve the system:

$9a + 3b + c = 0$

$49a + 7b + c = 0$

$25a + 5b + c = 8$

$f(x) = -2x^2 + 20x - 42$

$-2 + 20 + -42 =$  **-24**

Algebra Two Team Question # 3

$-3 \leq \frac{3x-5}{2} \leq 5$  or  $-3 \leq \frac{-3x+5}{2} \leq 5$

$-6 \leq 3x-5 \leq 10$  or  $-6 \leq -3x+5 \leq 10$

$-1 \leq 3x \leq 15$  or  $-11 \leq -3x \leq 5$

$-\frac{1}{3} \leq x \leq 5$  or  $\frac{11}{3} \geq x \geq -\frac{5}{3}$  **interval notation:**  $\left[-\frac{5}{3}, 5\right]$

Algebra Two Team Question # 4

	Rate	*	time	=	distance
Cousin 1	r		2		2r
Cousin 2	r + 8		2		2r + 16

$2r + (2r + 16) = 224$ ;  $4r + 16 = 224$ ;  $4r = 208$ ;  $r=52, r+8=60$

A= 52mph

B= 60mph

C=  $3(52)+3(60) = 336$  miles apart.

$336-2(52+60) =$  **112**

$\frac{p}{q} = \pm(1,2,3,6)$  use synthetic division to try possible roots:

$$\begin{array}{r|rrrrrr} -1 & 1 & -2 & -5 & 4 & 6 \\ & & -1 & 3 & 2 & -6 \\ \hline & 1 & -3 & -2 & 6 & 0 \end{array}$$

$1 -3 -2 6 | 0 \rightarrow x^3 - 3x^2 - 2x + 6$ , factor  $x^2(x-3) - 2(x-3) = (x^2 - 2)(x-3)$

So,  $(x+1)(x+\sqrt{2})(x-\sqrt{2})(x-3)$ .

Algebra Two Team Question # 6

$$B = \frac{1}{10-9} \begin{bmatrix} 2 & -3 \\ -3 & 5 \end{bmatrix} = \begin{bmatrix} 2 & -3 \\ -3 & 5 \end{bmatrix}$$

$$C = \begin{bmatrix} 5 & 3 \\ 3 & 2 \end{bmatrix} \begin{bmatrix} 5 & 3 \\ 3 & 2 \end{bmatrix} = \begin{bmatrix} 34 & 21 \\ 21 & 13 \end{bmatrix}$$

$$B \times C = BXC = \begin{bmatrix} 2 & -3 \\ -3 & 5 \end{bmatrix} \begin{bmatrix} 34 & 21 \\ 21 & 13 \end{bmatrix} = \begin{bmatrix} 5 & 3 \\ 3 & 2 \end{bmatrix} \quad \begin{array}{l} AA^{-1} = I \\ \text{(hint: and )} \\ IA = A \end{array}$$

Answer:  $\begin{bmatrix} 5 & 3 \\ 3 & 2 \end{bmatrix}$

Algebra Two Team Question # 7

Let  $A = (-2i)^9 - 13i^{61} = (-512i) - 13i = -525i$

$B = (1+i)^{18} = ((1+i)^2)^9 = (2i)^9 = 512i$

$C = (2+3i)(1-2i) = 8-i$

$-525i + 512i - (8-i) = \underline{-8-12i}$

Algebra Two Team Question # 8

algebraically:  $5(\frac{4}{x} - \frac{9}{y} = 48) \rightarrow + \frac{20}{x} - \frac{45}{y} = 240$   
 $-4(\frac{5}{x} + \frac{13}{y} = -37) \rightarrow -\frac{20}{x} - \frac{52}{y} = 148$   
 $\rightarrow -\frac{97}{y} = 388; -\frac{97}{388} = y; y = -\frac{1}{4}$

$13(\frac{4}{x} - \frac{9}{y} = 48) \rightarrow + \frac{52}{x} - \frac{117}{y} = 624$   
 $9(\frac{5}{x} + \frac{13}{y} = -37) \rightarrow + \frac{45}{x} + \frac{117}{y} = -333$   
 $\rightarrow \frac{97}{x} = 291; \frac{97}{291} = x; x = \frac{1}{3}$

$(\frac{1}{3}, -\frac{1}{4})$

Algebra Two Team Question # 9

$A = \frac{3}{2}, B = \frac{1}{2}, C = -\frac{5}{3}; \frac{3}{2} + 2(\frac{1}{2}) - 3(-\frac{5}{3}) = \frac{3}{2} + 1 + 5 = \frac{15}{2} \text{ or } 7\frac{1}{2}$ .

Algebra Two Team Question # 10

$$y^2 - 3x^2 = 12 \rightarrow \frac{y^2}{12} - \frac{x^2}{4} = 1$$

$$A \rightarrow y^2 = 3(0)^2 + 12 = 12$$

$$B \rightarrow y = \sqrt{3}x; m^2 = 3$$

C  $\rightarrow$  center (0,0)...x-coordinate for foci will be 0.

$$D \rightarrow y^2 = 3(1)^2 + 12 = 15$$

$$(12)(3) - (0)(15) = \underline{\mathbf{36}}$$

Algebra Two Team Question # 11

Geometric progression:  $a_3 = 44000(1.05)^{3-1}$ ;  $a_3 = 44000\left(\frac{105}{100}\right)^2$

$$a_3 = 4.4(11025) = \$48510.00$$

Algebra Two Team Question # 12

System of equations:  $n = 4d$   
 $0.05n + 0.10d = 45$

multiply the bottom by 100 to simplify and use substitution.  $5(4d) + 10d = 4500 \rightarrow$

$30d = 4500 \rightarrow 150$  dimes, so  $150 \times 4 = 600$  nickels

(600,150)

Algebra Two Team Question # 13

$$\text{by elimination, } + \begin{array}{r} x^2 + y^2 = 25 \\ x^2 - y^2 = 7 \\ \hline \end{array} \rightarrow 2x^2 = 32 \rightarrow x^2 = 16; x = \pm 4$$

By substitution:  $(\pm 4)^2 + y^2 = 25 \rightarrow y^2 = 9; y = \pm 3$

(4,3),(-4,3),(4,-3),(-4,-3).

$$A = 4 + 4 = 8$$

$$B = -3 + -3 = -6$$

$$A - B = 8 - -6 = \underline{\mathbf{14}}$$

Algebra Two Team Question # 14

$$c = a + b - 12$$

$a = \frac{1}{2}b + 10$  by substitution you get:  $\left(\frac{1}{2}b + 10\right) + b + \left(\left(\frac{1}{2}b + 10\right) + b - 12\right) = 188$

$$a + b + c = 188$$

$\rightarrow b = 60$ ; so  $a = 40$  and  $c = 88$

40, 60, 88

Algebra Two Team Question # 15

$$\det A = 1(2 * 11 - -6 * -2) - 5(2 * 1 - 7 * -2) = 1(10) - 5(16) = -70$$

$$B^{-1} = \frac{1}{(48 - -3)} \begin{bmatrix} 8 & 5 \\ -\frac{3}{5} & 6 \end{bmatrix} = \begin{bmatrix} \frac{8}{51} & \frac{5}{51} \\ -\frac{1}{85} & \frac{6}{51} \end{bmatrix}$$

$$\text{answer: } \begin{bmatrix} \frac{-560}{51} & \frac{350}{51} \\ \frac{14}{17} & -\frac{140}{17} \end{bmatrix}$$