

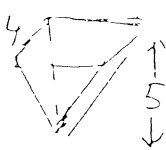
A) $(-80, -32)$ D) $3, -1/3$

B) $13\sqrt{13}$ E) $x < 1/2, x > 1$

C) 92 cents F) 4

A) An ice cream cone has the shape of a square pyramid of height 5 inches where the side of the square base is 4 inches. A spherical scoop of ice cream of diameter 4 inches is placed in the cone. If the ice cream were allowed to melt, the volume of ice cream that would overflow the cone is

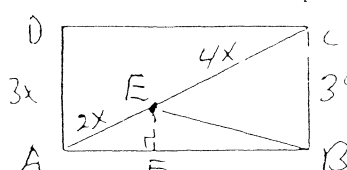
$V = \frac{1}{3} \pi r^2 h$ for the cone (16 in)



$V = \frac{1}{3} (16) = \frac{16}{3}$ in³ $V_{\text{sphere}} = \frac{4}{3} \pi r^3 = \frac{4}{3} \pi (2)^3 = \frac{32\pi}{3}$ in³

Ans $(-80, -32)$

B) In rectangle ABCD, E is on diagonal AC so that $AF = AD = FC = 2$, $3 = 4$ and $BC = 30$. Calculate EB in simplified radical form.



$x = 13$ $AE = 2x = 26$, $EC = 52$, $AC = 78$

$\triangle ABC = 30^\circ$ (so, 90° so $\angle CAB = 30^\circ$)

$AB = 39\sqrt{3}$, $AF = 13\sqrt{3}$, $FB = 26\sqrt{3}$, $EF = 13$

$EB = 13\sqrt{1^2 + 2\sqrt{3}^2} = 13\sqrt{13}$

C) Jon has a number of coins in his pocket. Eleven of them are nickels, one-seventh are dimes, and one-third are pennies. What is the total value of Jon's coins?

$x = \# \text{ coins}$ $\frac{1}{7}x + \frac{1}{3}x + 11 = x$, $\frac{10x}{21} + 11 = x$, $\frac{11x}{21} = 11$, $x = 21$

Nickels = 55¢, Dimes = 30¢, Pennies = 7¢ Ans 92 cents

D) Solve for x $\left(\frac{x+3}{x-1}\right)^2 - 6 = \frac{x+3}{x-1}$ $\frac{x+3}{x-1} = 3$, $x+3 = 3x-3$, $2x = 6$, $x = 3$

$\left(\frac{x+3}{x-1} - 3\right)\left(\frac{x+3}{x-1} + 2\right) = 0$ $\frac{x+3}{x-1} = -2$, $x+3 = -2x+2$, $3x = -1$, $x = -\frac{1}{3}$

E) Solve for x $\left(\frac{x}{x-1} - \frac{1}{2}\right) - \frac{x}{x-1} - 2 = 0$ $(x+1) - (x+1)(x-2) - 2(x-1) < 0$

multi by $(x-2)^2$ To get

Note! $(x-2)^2 > 0$

$-2x^2 + 11x - 5 < 0$

$2x^2 - 11x + 5 > 0$ $(2x-1)(x-5) > 0$

Ans $x < 1/2$ or $x > 5$

F) Given $x * y = 2x + 3y$, solve the equation $(3 * a) * (a * 3) = 24 * 13$ for a

$2(6 + 3a) + 3(2a + 9) = 48 + 39 = 87$, $12a + 39 = 87$, $a = 4$