Solutions for Meet 2

Individual Questions

1. $x - a = x - b$ *or* $x - a = -(x - b)$. We can reject the first since $a \neq b$ is given. Solving the second we get $x = \frac{a+b}{2}$

2.P(x+c) = $(x+c)^3 + 6(x+c)^2 + 7(x+c) + 2$, a polynomial whose second degree term is $3cx^2 + 6x^2$. To make this coefficient zero, c will equal c = -2

3.$f(72) = f(2^3 \cdot 3^2) = f(2) + f(2) + f(2) + f(3) + f(3) = 3a + 2b$

4. Let s be the side of the square and h be the side of the hexagon. So we have $s^2 = \frac{6h^2\sqrt{3}}{4}$. We get $\frac{s^2}{h^2} = \sqrt{\frac{27}{4}}$ *and* $\frac{s}{h} = \sqrt[4]{\frac{27}{4}}$. Finally $\frac{4s}{6h} = \frac{2s}{3h} = \sqrt[4]{\frac{16 \cdot 27}{81 \cdot 4}} = \sqrt[4]{\frac{4}{3}}$ *and* $k = \frac{4}{3}$

Solutions for Meet 2

Team Questions

1.If the final height of the water is x, then $\pi k^2 x = \pi k^2(12) - \frac{1}{3}\pi\left(\left[\frac{k}{2}\right]\right)^2(12)$. This gives $x = 12 - \frac{1}{3}\cdot\frac{1}{4}\cdot 12 = 11$.

2.Placing the three lines in a convenient position (which does not affect the angles formed). We have the vertex angle of 43, angle between the lines is $3 \cdot 43 = 129$.

3.1 down must be 125 or 625. 5 across must be 529 or 576. 3 down must be 243 or 729. Of which only 729 can work. 2 down must be 128 or 256 or 512, of which only 512 can work. 1 across must now be 157, since 657 is a multiple of 3. The solution is $\begin{vmatrix} 1 & 5 & 7 \\ 2 & 1 & 2 \\ 5 & 2 & 9 \end{vmatrix}$

4. Area of triangle ABC $= \frac{x^2\sqrt{3}}{4} = \frac{\sqrt{3}}{4}\left(\frac{3s^2}{36} + \frac{s^2}{4}\right) = \frac{s^2\sqrt{3}}{12} = \frac{1}{3\left(\frac{s^2\sqrt{3}}{4}\right)}$. Answer is $1:3$ or 1/3

5. Label a correct triangle with sides and angles. Since $h = b\ sinC$, we have $ha = 42$. Then the area equals $\frac{1}{2}ha = 21$