Presentations03

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| Generic presentation: Select a problem from your textbook in the section currently discussed and solve it. Get my okay and confirmation as a presentation topic.  |  |
| State and solve a Diophantine equation.   |  |
| Given the cubic equation $x^{3}+p=qx$ , let $b=\sqrt{q}, c=\frac{p}{b} $ and show that the equivalent equation $x^{3}+ b^{2}c= b^{2}x$ has a solution which is the intersection of the hyperbola $y^{2}+cx= x^{2}$ and the parabola $y= \frac{1}{b} x^{2}$. |  |
| Show that if $r$ is a root of the polynomial $x^{2}+bx+c$ then $x-r$ is a factor of that polynomial; similarly show that if r is a root of the polynomial $x^{3}+b x^{2}x+cx+d $ then $x-r$ is factor of that polynomial. [Hint, use long division.] |  |
| Show that if $P\left(x\right)=x^{n}+A\_{n-1 }x^{n-1}+A\_{n-2 }x^{n-2}+…+ A\_{1}x+A\_{0}=\left(x-r\_{1}\right)\left(x-r\_{2}\right)…(x-r\_{n})$ then $A\_{0}=r\_{1}r\_{2}…r\_{n}$ and $A\_{n-1 }= -r\_{1}-r\_{2}…-r\_{n}$.  |  |
| Problem (translated) from an old text: A man put one pair of rabbits in a certain place entirely surrounded by a wall, How many rabbits can be produced from that pair in a year, if the nature of these rabbits is such that every month each pair bears a new pair which from the second month on becomes productive? |  |
| Show that the ratio of the (n+1)th Fibonacci number to the nth limits to the golden ratio. |  |
| Given the general cubic equation: $x^{3}+ax^{2}+bx+c=0$, find a value for $k$ so that the transformation $x=t+k$ transforms the equation into one without a quadratic term. |  |
| Solve the cubic equation.   |  |
| Solve the quartic equation.   |  |
|  Fibonacci problem: A man entered an orchard through 7 gates and picked some apples. When he left, he gave the first guard half his apples and 1 apple more. To the second guard he gave half his remaining apples and 1 more. He did the same to each of the remaining five guards and left the orchard with 1 apple. How many apples did he gather in all? |  |
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