Problem 12

$$2x^3 - 6x^2 + 3x + 5 = 0$$

$$\frac{p}{q} = \pm 1, \pm\frac{1}{2}, \pm 5, \pm\frac{5}{2}$$

$$x_1 + x_2 + x_3 = -\frac{b}{a} = \frac{6}{2} = 3$$

$$x_1x_2 + x_1x_3 + x_2x_3 = \frac{c}{a} = \frac{3}{2}$$

$$x_1 \cdot x_2 \cdot x_3 = -\frac{d}{a} = -\frac{5}{2}$$

$$(x_1+x_2+x_3)^2 = x_1^2 + x_2^2 + x_3^2 + 2(x_1x_2 + x_1x_3 + x_2x_3)$$

$$x_1^2 + x_2^2 + x_3^2 = 3^2 - 2\cdot\frac{3}{2} = 9 - 3 = 6$$

ANSWER: B

Problem 13

$$2^{\frac{1}{4}} \cdot 2^{\frac{1}{8}} \cdot 2^{\frac{1}{16}} \cdots\cdots = 2^{\left(\frac{1}{2}\right)^2} \cdot 2^{\left(\frac{1}{2}\right)^3} \cdot 2^{\left(\frac{1}{2}\right)^4} \cdots\cdots =$$

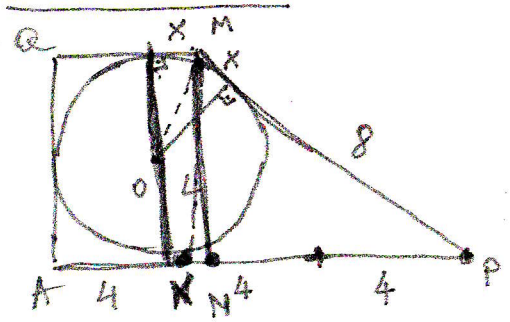
$$= 2^{\left(\frac{1}{2}\right)^2 + \left(\frac{1}{2}\right)^3 + \left(\frac{1}{2}\right)^4 + \cdots + \cdots} = 2^{\left(\frac{1}{2}\right)^2\left(1 + \frac{1}{2} + \left(\frac{1}{2}\right)^2 + \cdots \left(\frac{1}{2}\right)^{n-1} + \cdots\right)}$$

$$= 2^{\left(\frac{1}{2}\right)^2\left(\frac{1-\left(\frac{1}{2}\right)^n}{1-\frac{1}{2}}\right)} = 2^{\frac{1}{2}}$$

$$4^{\log_2 2^{\frac{1}{2}}} = 4^{\frac{1}{2}} = 2$$

ANSWER: C

Problem 14



$\cancel{OM^2 = x^2 + 4^2}$ $\quad MN \perp AP$

ΔMNP : $MN = 8$

$NP = 8 - x$

$MP = 8 + x$

$$8^2 + (8-x)^2 = (8+x)^2 \Rightarrow x = 2$$

$$S_{APMQ} = \frac{[12 + (4+2)]}{2} \cdot 8 = 72$$

ANSWER: A