

$$f(n) = \begin{cases} (a+1)(n+r) & n > 1 \\ \gamma a + \gamma_m & n \leq 1 \end{cases}$$

$$\gamma f(a) = f(-r) + a$$

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$$f(-r) = \gamma a - r$$

$$\gamma f(a) = \gamma a - r + a \leadsto (a+1)(r) = \gamma a - r \leadsto 1 \gamma a + 1 r, \gamma a - r$$

$$\leadsto 10a - 1r \leadsto a - 1, 1 \checkmark$$

$$f(r-\sqrt{r}) + f(r+\sqrt{r})$$

$$f(n) = \sqrt{n} + \frac{1}{\sqrt{n}} + r$$

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$$f(r+\sqrt{r}) = \sqrt{r+\sqrt{r}} + \frac{1}{\sqrt{r+\sqrt{r}}} + r \leadsto \sqrt{r+\sqrt{r}} + \sqrt{r-\sqrt{r}} + r$$

$$\sqrt{(\sqrt{r+\sqrt{r}} + \sqrt{r-\sqrt{r}})^2} = \sqrt{r+\sqrt{r} + r-\sqrt{r} + r} = \sqrt{r+\sqrt{r} + \sqrt{r-\sqrt{r}} + \sqrt{r-\sqrt{r}} + r} \leadsto f(r+\sqrt{r}) + f(r-\sqrt{r})$$

$$r-\sqrt{r} = r - \sqrt{r} \times \frac{r+\sqrt{r}}{r+\sqrt{r}} = \frac{1}{r+\sqrt{r}} \leadsto f(r-\sqrt{r}) = f\left(\frac{1}{r+\sqrt{r}}\right) \leadsto f(r-\sqrt{r}) + f(r+\sqrt{r})$$

$$\leadsto f(r-\sqrt{r}) + f(r+\sqrt{r}) = \gamma f(r+\sqrt{r}) = \gamma(\sqrt{r} + r) = \gamma\sqrt{r} + r \checkmark$$

$$\gamma f(m) - \gamma f(-n) = f(m^2 - n) \xrightarrow{xy} \gamma f(m) - \gamma f(-n) = 1 m^2 - f_n$$

$$\xrightarrow{m \rightarrow -n} \gamma f(-n) - \gamma f(m) = f(m^2 + n) \xrightarrow{xy} \gamma f(-n) - \gamma f(m) = 1 m^2 + f_n$$

$$- \Delta f(m) = 2 \gamma m^2 + n$$

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$$\leadsto - \Delta f(m) = 2 \gamma m^2 + n \leadsto \left(f(m) = - f x^2 - \frac{1}{\omega} n \right) \checkmark$$

$$(\gamma + r) f(m) - \gamma_m f(n+r) = f(m^2 - mn + r_m - 1)$$

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$$\xrightarrow{n=0} \gamma f(0) - \gamma(0) f(r) = \gamma_m - 1 \leadsto \gamma f(0) = \gamma_m - 1 \quad \text{(*)} \quad \gamma f(0) = \gamma_m - r$$

$$\xrightarrow{n=-r} \gamma f(-r) + \gamma f(0) = 1 \gamma + \gamma_m + \gamma_m - 1 \leadsto \gamma f(0) = \omega m + 1 \omega$$

$$\leadsto \gamma f(0) = 1 \gamma_m - 1 \leadsto \left(f(0) = \gamma / \gamma_m \right) \checkmark$$

$$f(m) + f\left(\frac{1}{m}\right) = \frac{\gamma m^2 - 1 \gamma m + r}{m}$$

$$\xrightarrow{m=1} f(1) + f(1) = \frac{\gamma + 1 \gamma + r}{-1} \leadsto \gamma f(-1) = 1 \gamma \leadsto \underline{f(-1) = -\gamma} \checkmark$$

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