

۲. آنتین

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اعداد صحیح: ۱, -۱, -۲

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$$f(f(1)) + f(f(4))$$

$$1 < 2 \Rightarrow f(1) = 1 + 2 = 3$$

$$4 > 2 \Rightarrow f(4) = 4 - 2 = 2$$

$$f(1) + f(4) = 3 + 2 = 5$$

$$4 > 2 \Rightarrow f(4) = 4 - 2 = 2$$

$$1 < 2 \Rightarrow f(1) = 1 + 2 = 3$$

(۲) ✓

$$f(x) = ax^2 + bx + c$$

$$f(n-1) = a(n-1)^2 + b(n-1) + c$$

$$f(n-1) = f(n) = 4n + 7$$

$$f(n-1) - f(n) = a(n-1)^2 + b(n-1) + c - (an^2 + bn + c) = -2an + a + b = 4n + 7$$

$$-2a + a + b = 4 \Rightarrow -a + b = 4 \Rightarrow a = b - 4$$

$$a - b = -2 - 4 = -6$$

$$a + b = 7 \Rightarrow b = 7 - a$$

$$f(n) = 2^r - 2n + 1$$

$$f(r) = 2^r - 2r + 1 = 1$$

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

$$f(-1) = 1 + 2 + 1 = 4$$

$$f(r) = 2 - 2 + 1 = 1$$

$$\frac{r(1) + 4}{1} = 5$$

✓

$$\frac{r f(r) - r f(-r)}{f(r)}$$

$$f(r) \Rightarrow f(r) = 2^r r + 1 = 1$$

$$-r(-r) \Rightarrow f(-r) = 2$$

$$f(r) = 2^r r + 1 = 1$$

$$\frac{r(1) - r(2)}{1} = \frac{r-2}{1}$$

✓

$$\frac{f(f(r)) - f(f(r))}{f(1) - r} = \frac{f(1) - f(r)}{1 - r} = \frac{1 - 1}{1 - r} = 0$$

✓

$$f(n) = \frac{n^r + \frac{1}{n} + 9}{n^r + \frac{1}{n} + 8}$$

$$n^r + \frac{1}{n} + 8 \neq 0$$

✓

$$f(\sqrt{r} - r) = \frac{(\sqrt{r} - r)^r + \frac{1}{\sqrt{r} - r} + 9}{(\sqrt{r} - r)^r + \frac{1}{\sqrt{r} - r} + 8} = \frac{r + \frac{1}{\sqrt{r} - r} + 9}{r + \frac{1}{\sqrt{r} - r} + 8} = \frac{1}{1}$$

$$f(r) = \frac{r^r + \frac{1}{r} + 9}{r^r + \frac{1}{r} + 8} = \frac{r^r + \frac{1}{r} + 9}{r^r + \frac{1}{r} + 8}$$

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

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

✓

$$(n + \frac{1}{n})^r - (n^r + \frac{1}{n^r}) = n^r + \frac{1}{n^r} + r - n^r - \frac{1}{n^r} = r$$

1.