

1

$x f(x) \geq 0$
 $x \leq 0$
 $f(x) = 0 \rightarrow x = -5, 2, 0$

$D = [-5, 0] \cup [2, 0]$
 به ترتیب به عدددار

-5 0 2 0
 - + - + -

2

$\frac{-x}{f(x)} \geq 0$
 $x \leq 0$
 $f(x) = 0 \rightarrow x = -3, 0, 2, 0$
 $y = f(x) < 0, x > 0$
 $y = f(x) > 0, x < 0$

$D = (-3, 0) \cup (0, 2) \rightarrow$ به ترتیب به عدددار

-3 0 2 0
 - + + - +

3 2 1
 - - -

3

$f(-2) - 2f(2) = 5 + 4 + 6$
 $f(2) - 2f(-2) = 5 - 4 + 6$
 $f(-2) = 15 + 2f(2)$
 $-f(2) = 2$
 $f(2) = -2$
 $f(-2) = 15$

4

$f(f(0)) + f(f(1)) = 9$
 $0 < 2 \rightarrow 0 - \sqrt{0+4} = 2$
 $1 < 2 \rightarrow 2(1) + 2 = 0$
 $2 < 2 \rightarrow 2(2) + 2 = 6$
 $0 > 2 \rightarrow 0 - \sqrt{0+4} = -2$

5

$f(n-1) - f(n) = 4n + 2$
 $f(x) = ax^2 - bx + 2$
 $f(n-1) = a(n-1)^2 - b(n-1) + 2 = a(n^2 + 1 - 2n) - bn + b + 2$
 $a(n^2 + 1 - 2n) - bn + b + 2 - (an^2 - bn + 2) = 4n + 2$
 $a + 2an + b = 4n + 2$
 $4 = -2a \rightarrow a = -2$
 $a + b = 2 \rightarrow b = 4$
 $a - b = -2 - 4 = -6 \rightarrow$

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

6

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

7

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

8

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

$$\frac{r + r + r(\sqrt{r}) + r(\sqrt{r}) + 1}{(r)^2 + r(r) + 0} = \frac{1}{1-r}$$

9

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

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

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