

$$f(x) = x^r - rx + 1$$

$$\frac{rf(r) + f(-1)}{f'(r)} = \frac{r(9 - 9 + 1) + (1 - 9 + 1)}{(r - 9 + 1)^r} = \frac{r + 1}{1} = \boxed{V}$$

Ⓟ ✓

6

$$f(x) = \begin{cases} rx + 1 & x \geq r \\ x^r & x < r \end{cases}$$

$$\frac{rf(r) - rf(-r)}{f(r)} = \frac{r(r(r) + 1) - r((-r)^r)}{r(r) + 1} = \frac{rq - 1}{V} = \boxed{\frac{VI}{V}}$$

Ⓟ ✓

V

$$f = \{(r, 4), (r, r), (1, 1), (1, 4)\}$$

$$\frac{f(f(r)) - f(f(r))}{f(1) - r} = \frac{f(1) - f(r)}{4 - r} = \frac{4 - 4}{r} = \frac{0}{r} = \boxed{0}$$

Ⓟ ✓

Λ

$$f(x) = \frac{x^r + rx + 9}{x^r + 6x + 1} = \frac{x^r + 6x + r + 1}{x^r + 6x + 1} = \frac{(x+r)^r + 1}{(x+r)^r + 1}$$

$$f(f(\sqrt{r-1})) = f(r) = \frac{14 + 1}{14} = \boxed{\frac{15}{14}}$$

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

Ⓟ ✓

9

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

$$(f(\sqrt{x}))^r - f(x) = (x + \frac{1}{x})^r - f(x) = x^r + \frac{r}{x^r} + r - x^r - \frac{r}{x^r} = \boxed{r}$$

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

Ⓟ ✓

10