

P126
#13-22

13. $f(x) = 3x - 6$ $y = 3x - 6$ $x = 3y - 6$ $x + 6 = 3y$
 $y = \frac{1}{3}x + 2$ $f^{-1}(x) = \frac{1}{3}x + 2$

$$f^{-1}(x) = \frac{1}{3}x + 2$$

$mx + b$

$$\frac{x+6}{3}$$

$$= \frac{x}{3} + \frac{6}{3}$$

$$= \frac{1}{3}x + 2$$

Linear
 $D: (-\infty, \infty)$

14) $f(x) = 2x + 5$

$y = 2x + 5$
 $x = 2y + 5$ $y = \frac{x-5}{2}$ $f^{-1}(x) = \frac{x-5}{2}$

$$\frac{x-5}{2} = \frac{2y}{2}$$

$D: (-\infty, \infty)$ $\frac{1}{2}x - \frac{5}{2}$

15) $f(x) = \frac{2x-3}{x+1}$

Ex 4
Notes

$$y = \frac{2x-3}{x+1}$$

(y+1) $x = \frac{2x-3}{\cancel{y+1}}$ $y+1$

$$xy + x = 2y - 3$$

$$xy - 2y = -x - 3$$

$$y(x-2) = -x-3$$

D:
 $(-\infty, 2) \cup (2, \infty)$

$$y = \frac{-x-3}{x-2}$$

$$f^{-1}(x) = \frac{-x-3}{x-2}$$

Equivalent
 expressions -

$$= \frac{-(x+3)}{x-2}$$

$$= \frac{x+3}{2-x}$$

①⑥ $f(x) = \frac{x+3}{x-2}$

$$y = \frac{x+3}{x-2}$$

$(y-2)$
 $x = y+3$

$$y-2x = y+3$$

$$xy - y = 2x + 3$$

$$\boxed{f^{-1}(x) = \frac{2x+3}{x-1}}$$

$$(-\infty, 1) \cup (1, \infty)$$

17)

$$f(x) = \sqrt{x-3}$$

$$y = \sqrt{x-3}$$

$$(x)^2 = (\sqrt{y-3})^2$$

$$x^2 = y-3$$

$$x^2 + 3 = y$$

D: $(-\infty, \infty)$

$$f^{-1}(x) = x^2 + 3$$

$$\begin{aligned}
 18) \quad f(x) &= \sqrt{x+2} \\
 y &= \sqrt{x+2} \\
 x^2 &= (\sqrt{y+2})^2 \\
 x^2 &= y+2 \\
 x^2 - 2 &= y
 \end{aligned}$$

$$f^{-1}(x) = x^2 - 2$$

$$D: (-\infty, \infty)$$

$$19) \quad f(x) = x^3 \quad \text{Ex 3 in notes}$$

$$y = x^3$$

$$\sqrt[3]{x} = \sqrt[3]{y}$$

$$y = \sqrt[3]{x}$$

$$f^{-1}(x) = \sqrt[3]{x}$$

20)

$$f(x) = \sqrt{x^3 + 5}$$

$$y = \sqrt{x^3 + 5}$$

$$(x) = (\sqrt{y^3 + 5})^2$$

$$x^2 = y^3 + 5$$

$$y^3 = x^2 - 5$$

$$y = \sqrt[3]{x^2 - 5}$$

$$f^{-1}(x) = \sqrt[3]{x^2 - 5}$$

21)

$$f(x) = \sqrt[3]{x+5}$$

$$y = \sqrt[3]{x+5}$$

$$(x) = (\sqrt[3]{y+5})^3$$

$$x^3 = y + 5$$

$$y = x^3 - 5$$

$$f^{-1}(x) = x^3 - 5$$

Cubic

$$D: (-\infty, \infty)$$

22)

$$f(x) = \sqrt[3]{x-2}$$

$$y = \sqrt[3]{x-2}$$

$$(x) = (\sqrt[3]{y-2})^3$$

$$x^3 = y - 2$$

$$y = x^3 + 2$$

$$f^{-1}(x) = x^3 + 2$$

Cubic

$$D: (-\infty, \infty)$$