(25) $(10x)^{\frac{4}{3}}$

$\sqrt{10^4 x^4}$

$\boxed{10x\sqrt[3]{10x}}$

(26) $(3a)^{-\frac{1}{3}}$

$3^{-1/3}\,a^{-1/3}$

$\frac{1}{3^{\frac{1}{3}}a^{\frac{1}{3}}} \cdot \frac{3^{\frac{2}{3}}a^{\frac{2}{3}}}{3^{\frac{2}{3}}a^{\frac{2}{3}}} = \boxed{\frac{\sqrt[3]{9a^2}}{3a}}$

(27) $k^{\frac{7}{4}}$

$\sqrt[4]{k^7}$

$\boxed{k\sqrt[4]{k^3}}$

(28) $p^{-\frac{1}{2}} \cdot \frac{1}{p^{\frac{1}{2}}} = \frac{1}{\sqrt{p}} \cdot \frac{\sqrt{p}}{\sqrt{p}} = \boxed{\frac{\sqrt{p}}{p}}$

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

$x - 3 \geq 0$

$\boxed{D: x \geq 3}$

(30) $y = \sqrt{x} + 3$

$\boxed{D: x \geq 0}$

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

$\boxed{D: \text{all real numbers}}$

(32) $y = \sqrt[3]{x}$

$\boxed{D: \text{all real numbers}}$

(33) $\frac{m+4}{m^2+13m+36} = \frac{m+4}{(m+4)(m+9)}$

$\boxed{D: \text{all real numbers except } -4 \text{ and } -9}$

(34) $\frac{45}{35n-15}$

$35n - 15 = 0$

$35n = 15$

$n = \frac{15}{35} = \frac{3}{7}$

$\boxed{D: \text{all real numbers except } \frac{3}{7}}$

(35) $\frac{r-3}{r^2-12r+27} = \frac{r-3}{(r-9)(r-3)}$

$\boxed{D: \text{all real numbers except } 9 \text{ and } 3}$

(36) $\frac{8x+32}{x+4}$

$\boxed{D: \text{all real numbers except } -4}$

(37) $f(x) = (x-2)^3 + 3$

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

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

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

$\boxed{\sqrt[3]{x-3} + 2 = y \quad f^{-1}(x)}$

(38) $f(x) = (x-2)^5 - 1$

$x = (y-2)^5 - 1$

$x + 1 = (y-2)^5$

$\sqrt[5]{x+1} = y - 2$

$\boxed{\sqrt[5]{x+1} + 2 = y \quad f^{-1}(x)}$