

1) $x^3 - 12x^2 + 15x - 10$

$$\begin{array}{r|l} x^3 - 12x^2 + 15x - 10 & x-1 \\ \hline -x^3 + 12x^2 - 15x + 10 & \\ \hline 15x^2 - 15x - 10 & \\ \hline -15x^2 + 15x + 10 & \\ \hline 0 & \end{array}$$

$= \frac{n+1}{(n-1)(n-3)(n-5)}$

$P_f = R - \{1, 3, 5\}$

2) $x^3 - 12x^2 + 15x - 10$

$$\begin{array}{r|l} x^3 - 12x^2 + 15x - 10 & x+1 \\ \hline -x^3 + 12x^2 - 15x + 10 & \\ \hline 27x^2 - 27x - 10 & \\ \hline -27x^2 + 27x + 10 & \\ \hline 0 & \end{array}$$

$= \frac{n+3}{(n+1)(n+2)(n-4)}$

$P_f = R - \{-2, -1, \frac{1}{2}\}$

3) $x - \sqrt{x^2 - 4} \neq 0 \Rightarrow x^2 - 4 \neq x^2$

$\Rightarrow (x+2)(x-2) \neq 0 \Rightarrow x \neq -2, 2$

$P_f = R - \{-2, 2\}$

4) $x - \sqrt{x^2 - 4} \geq 0 \Rightarrow x^2 - 4 \geq 0 \Rightarrow x \geq 2$

$P_f = R - \{1, 2\}$

5) $\cos x \neq \frac{1}{2}$

$P_f = R - \{x \mid x \neq \pm \frac{\pi}{3}\}$

6) $\sin x \neq -\frac{1}{2}$

$P_f = R - \{x \mid x \neq -\frac{\pi}{6}, -\frac{5\pi}{6}\}$

7) $\cos x \neq \frac{1}{2}$

$P_f = R - \{x \mid x \neq \pm \frac{\pi}{3}\}$

8) $(n-3)(n-2) > 0$

$P_f = (-\infty, 2) \cup (3, +\infty)$

9) $(n-1)(n-4) < 0$

$P_f = (1, 4)$

10) $(n-1)(n-2) < 0$

$P_f = (-\infty, 1) \cup (2, +\infty)$

11) $(n-3)(n-1) \geq 0$

$P_f = (-\infty, -1] \cup [3, +\infty)$

12) $x^3 - 3x > 0 \Rightarrow x(x-3)(x+3) > 0$

$P_f = (-\infty, -3) \cup (0, 3) \cup (3, +\infty)$

13) $(x-2)(x+2) > 0$

$P_f = (-\infty, -2) \cup (2, +\infty)$

14) $(n-1)(n-3) > 0$

$P_f = (-\infty, 1) \cup (3, +\infty)$

15) $y = \frac{n(n-1)}{n(n+1)}$

16) $y = \frac{n(n-1)}{n(n+1)}$

17) $f(n) = 0 \Rightarrow n = 0$

$P_f = \{0\}$

