

5.8

1) $x^2 > x$

$x^2 - x > 0$

$x(x-1) > 0$

		0	1	
x		-	0	+
$x - 1$		-	-	0
$P(x)$		+	0	-

$S =]-\infty; 0[\cup]1; +\infty[$

2) $x^3 < 4x$

$x^3 - 4x < 0$

$x(x^2 - 4) < 0$

$x(x-2)(x+2) < 0$

		-2	0	2		
x		-		-	0	+
$x-2$		-		-	-	0
$x+2$		-	0	+		+
$P(x)$		-	0	+	0	-

$S =]-\infty; -2[\cup]0; 2[$

3) $x^2 - 3x > -2$

$x^2 - 3x + 2 > 0$

$(x-1)(x-2) > 0$

		1	2			
$x - 1$		-	0	+		+
$x - 2$		-		-	0	+
$P(x)$		+	0	-	0	+

$S =]-\infty; 1[\cup]2; +\infty[$

4) $(x-2)^2 > 4(x-1)^2$

$(x-2)^2 - 4(x-1)^2 > 0$

$(x-2)^2 - (2(x-1))^2 > 0$

$((x-2) - 2(x-1))((x-2) + 2(x-1)) > 0$

$-x(3x-4) > 0$

		0	$\frac{4}{3}$			
$-x$		+	0	-		-
$3x-4$		-		-	0	+
$P(x)$		-	0	+	0	-

$S =]0; \frac{4}{3}[$

$$\begin{aligned}
5) \quad & x^3 - 1 < x^2 - 2x + 1 \\
& (x^3 - 1) - (x^2 - 2x + 1) < 0 \\
& (x - 1)(x^2 + x + 1) - (x - 1)^2 < 0 \\
& (x - 1)((x^2 + x + 1) - (x - 1)) < 0 \\
& (x - 1)(x^2 + 2) < 0
\end{aligned}$$

$x - 1$	$-$	$\frac{1}{0}$	$+$
$x^2 + 2$	$+$	0	$+$
$P(x)$	$-$	0	$+$

$$\Delta = 0^2 - 4 \cdot 1 \cdot 2 = -8 < 0$$

$$S =]-\infty; 1[$$

$$\begin{aligned}
6) \quad & (x + 3)^2 > 5(x + 3)(x - 2) \\
& (x + 3)^2 - 5(x + 3)(x - 2) > 0 \\
& (x + 3)((x + 3) - 5(x - 2)) > 0 \\
& (x + 3)(-4x + 13) > 0
\end{aligned}$$

$x + 3$	$-$	$\frac{-3}{0}$	$+$	$\frac{13}{4}$	$+$
$-4x + 13$	$+$	0	$+$	0	$-$
$P(x)$	$-$	0	$+$	0	$-$

$$S =]-3; \frac{13}{4}[$$

$$\begin{aligned}
7) \quad & (x - 1)^2(x - 2) < (x^2 - 1)(2 - x) \\
& (x - 1)^2(x - 2) - (x^2 - 1)(2 - x) < 0 \\
& (x - 1)^2(x - 2) + (x - 1)(x + 1)(x - 2) < 0 \\
& (x - 1)(x - 2)((x - 1) + (x + 1)) < 0 \\
& 2x(x - 1)(x - 2) < 0
\end{aligned}$$

$2x$	$-$	$\frac{0}{0}$	$+$	$\frac{1}{0}$	$+$	$\frac{2}{0}$	$+$
$x - 1$	$-$	$-$	0	$+$	0	$+$	$+$
$x - 2$	$-$	$-$	0	$-$	0	$+$	$+$
$P(x)$	$-$	0	$+$	0	$-$	0	$+$

$$S =]-\infty; 0[\cup]1; 2[$$

$$\begin{aligned}
8) \quad & (2x - 1)^2 > 9(2 - x)^2 \\
& (2x - 1)^2 - (3(2 - x))^2 > 0 \\
& ((2x - 1) - 3(2 - x))((2x - 1) + 3(2 - x)) > 0 \\
& (5x - 7)(-x + 5) > 0
\end{aligned}$$

$5x - 7$	$-$	$\frac{7}{5}$	$+$	$\frac{5}{0}$	$+$
$-x + 5$	$+$	0	$+$	0	$-$
$P(x)$	$-$	0	$+$	0	$-$

$$S =]\frac{7}{5}; 5[$$