

5.5

1) $9x^2 - 4 = (3x - 2)(3x + 2)$

			$-\frac{2}{3}$		$\frac{2}{3}$	
$3x - 2$		-		-	0	+
$3x + 2$		-	0	+		+
$P(x)$		+	0	-	0	+

2) $8x^3 - 1 = (2x - 1)(4x^2 + 2x + 1)$

			$\frac{1}{2}$	
$2x - 1$		-	0	+
$4x^2 + 2x + 1$		+		+
P(x)		-	0	+

 $\Delta = 2^2 - 4 \cdot 4 \cdot 1 = -12 < 0$

3) $1 - x^4 = (1 - x^2)(1 + x^2) = (1 - x)(1 + x)(1 + x^2)$

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

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

4) $4x^2 - 12x + 9 = (2x - 3)^2$

		$\frac{3}{2}$	
$(2x - 3)^2$		+	0
P(x)		+	0

5) $x^2 + 3x + 2 = (x + 1)(x + 2)$

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

6) $x^4 - 13x^2 + 36 = (x^2 - 4)(x^2 - 9) = (x - 2)(x + 2)(x - 3)(x + 3)$

		-3		-2		2		3		
$x - 2$		-		-		0	+		+	
$x + 2$		-		-	0	+		+		+
$x - 3$		-		-		-		-	0	+
$x + 3$		-	0	+		+		+		+
P(x)		+	0	-	0	+	0	-	0	+

$$7) \frac{1}{2-x} + 1 = \frac{1+1(2-x)}{2-x} = \frac{3-x}{2-x}$$

$3-x$		+	$\parallel$	+	$\overset{2}{0}$	-
$2-x$		+	$\parallel$	-	$\overset{3}{0}$	-
$F(x)$		+	$\parallel$	-	$\overset{0}{0}$	+

$$8) x + \frac{2}{x-3} = \frac{x(x-3)+2}{x-3} = \frac{x^2-3x+2}{x-3} = \frac{(x-1)(x-2)}{x-3}$$

$x-1$		-	$\overset{1}{0}$	+		+	$\parallel$	+
$x-2$		-	$\overset{2}{0}$	-	$\overset{3}{0}$	+	$\parallel$	+
$x-3$		-	$\overset{0}{0}$	-	$\overset{0}{0}$	-	$\parallel$	+
$F(x)$		-	$\overset{0}{0}$	+	$\overset{0}{0}$	-	$\parallel$	+

$$9) (x-2) \left(\frac{3}{2-x} - 3x \right) = (x-2) \cdot \frac{3-(2-x)3x}{2-x} = (x-2) \cdot \frac{3x^2-6x+3}{2-x}$$

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

$x-2$		-	$\overset{1}{0}$	-	$\overset{2}{0}$	+
3		+	$\overset{0}{0}$	+	$\overset{0}{0}$	+
$(x-1)^2$		+	$\overset{0}{0}$	+	$\overset{0}{0}$	+
$2-x$		+	$\overset{0}{0}$	+	$\overset{0}{0}$	-
$F(x)$		-	$\overset{0}{0}$	-	$\overset{0}{0}$	-