1) $3x^2+x+3+\frac{4}{x-2}$

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

3) x^2-2

4) $3x^2-5x+6-\frac{2}{x+1}$

5) $t^3-2+\frac{3}{t+5}$

6) $2u^3+3u^2+2$

7) $2s^3-s^2-3s-2$

8) $y^3-2y^2+1+\frac{2}{y+2}$

9) $x^4+x^3+x^2+x+1$

10) $x^5-x^4+x^3-x^2+x-1$

11) $2x^3-x^2+x-2$

12) $3x^5+x^4-x-3$

13) $x^2-2x+3-\frac{5}{2x+1}$

14) $2x^2-2x+1$

15) $2t^3+3t^2+2t-2$

16) $s^3+2+\frac{8}{5s-3}$

17) $z^2+(-2+2i)z-4i+\frac{3}{2zi}$

18) $z^2(3+i)z+(3+2)\; \frac{3i}{z-i}$

19) $Q(x)=2x^2-x-3$, $R=-5$

20) $Q(x)=x^3+2$, $R=5$

21) $Q(x)=2z^2-(3+4)z+6i$, $R=2$

22) $Q(x)=z^2\, iz-(4+2i)$, $R=0$ + $(4+2i)$

---

4) $\dfrac{3x^3-2x^2+x+4}{x+1}$

$$
\begin{array}{c|cccc}
 & 3 & -2 & 1 & 4 \\
-1 & & -3 & 5 & -6 \\
\hline
 & 3 & -5 & 6 & -2
\end{array}
$$

$$\boxed{3x^2-5x+6-\frac{2}{x+1}}$$

---

10) $\dfrac{x^6-1}{x+1}$

$$
\begin{array}{c|ccccccc}
 & 1 & 0 & 0 & 0 & 0 & 0 & -1 \\
-1 & & -1 & 1 & -1 & 1 & -1 & 1 \\
\hline
 & 1 & -1 & 1 & -1 & 1 & -1 & 0
\end{array}
$$

$$\boxed{x^5-x^4+x^3-x^2+x-1}$$

---

12) $\dfrac{3x^6-2x^5-x^4-x^2-2x+3}{x-1}$

$$
\begin{array}{c|ccccccc}
 & 3 & -2 & -1 & 0 & -1 & -2 & 3 \\
1 & & 3 & 1 & 0 & 0 & -1 & -3 \\
\hline
 & 3 & 1 & 0 & 0 & -1 & -3 & 0
\end{array}
$$

$$\boxed{3x^5+x^4-x-3}$$

---

13) $\dfrac{2x^3-3x^2+4x-2}{2x+1}$

$2x+1=0$
$2x=-1$
$\frac{2x}{2}=\frac{-1}{2}$
$x=-\frac{1}{2}$

$$
\begin{array}{c|cccc}
 & 2 & -3 & 4 & -2 \\
-\frac12 & & -1 & 2 & -3 \\
\hline
 & 2 & -4 & 6 & -5
\end{array}
$$

$$\boxed{x^2-2x+3-\frac{5}{2x+1}}$$
or
$$2x^2-4x+6-\frac{5}{x+\frac12}$$

We divide the quotient by the same amount we divide the divisor, in this problem, the value is 2.

---

16) $\dfrac{5x^4-3x^3+10x+2}{5x-3}$

$5x-3=0$
$5x=3$
$x=\frac{3}{5}$

$$
\begin{array}{c|ccccc}
 & 5 & -3 & 0 & 10 & 2 \\
\frac35 & & 3 & 0 & 0 & 6 \\
\hline
 & 5 & 0 & 0 & 10 & 8
\end{array}
$$

$$5x^3+10+\frac{8}{x-\frac35}$$

$$\boxed{x^3+2+\frac{8}{5x-3}}$$

18) $\dfrac{z^3+3z^2-2z+3}{z-i}$

	1	3	-2	3
i	$\downarrow$	i	$-1+3i$	$-3-3i$
	1	$(3+i)$	$-3+3i$	$\parallel -3i$

$$z^2+(3+i)z-3+3i-\frac{3i}{z-i}$$

---

21) $2z^3-3z^2+8z-10=(z+2i)\,Q(z)+R$

	2	-3	8	-10
$-2i$		$-4i$	$-8+6i$	12
	2	$(-3-4i)$	$6i$	$\parallel 2$

$$Q(z)=2z^2+(-3-4i)z+6i$$
$$R=2$$