C1 Jan 2009

⑦ a) $f(x) = x^3 - 17$ when divided by $x-3$ has

Remainder $f(3) = 3^3 - 17$
$= 27 - 17 = 10$

b) $g(x) = 6x^3 - 7x^2 - 14x + 8$

$g(1) = 6 - 7 - 14 + 8 \neq 0$
$g(2) = 48 - 28 - 28 + 8 = 0$ $(x-2)$ is a factor

$$
\begin{array}{r}
6x^2 + 5x - 4 \\
x-2 \overline{)\ 6x^3 - 7x^2 - 14x + 8} \\
6x^3 - 12x^2 \\
\hline
5x^2 - 14x \\
5x^2 - 10x \\
\hline
-4x + 8 \\
-4x + 8 \\
\hline
0
\end{array}
$$

$g(x) = (x-2)(6x^2 + 5x - 4) = 0$
$\Rightarrow (x-2)(2x-1)(3x+4) = 0$

$x = 2$ $x = \frac{1}{2}$ $x = -\frac{4}{3}$