Please do not write in the margins of the page!
Show all of your work on this paper: you are being graded on your work. No other paper may be used during this quiz.

1) Divide, using long division: write your quotient and remainder in the spaces below.
$\frac{8 x^{3}+18 x^{2}+21 x+18}{2 x+3}$
Quotient: $4 x^{2}+3 x+6$
Remainder: 0
divide here:

$$
2 x+3) \begin{array}{r}
4 x^{2}+3 x+6 \\
\frac{8 x^{3}+18 x^{2}+21 x+18}{-8 x^{3}-12 x^{2}} \\
\frac{6 x^{2}+21 x}{-6 x^{2}-9 x} \\
\frac{-12 x}{}+18
\end{array}
$$

2) Divide, using synthetic division: $\frac{x^{4}-3 x^{2}-5 x+2}{x-2}$

Quotient: $x^{3}+2 x^{2}+x-3$
Remainder: -4
divide here:

2 | 1 | 0 | -3 | -5 | 2 |
| ---: | ---: | ---: | ---: | ---: |
|  | 2 | 4 | 2 | -6 |
| 1 | 2 | 1 | -3 | -4 |

3) Using the remainder theorem, without using either long division or synthetic division, find the remainder you would get dividing $x^{20}-6 x^{10}+9$ by $x-1$
The remainder theorem says that the remainder when dividing $\mathrm{p}(\mathrm{x})$ by $\mathrm{x}-\mathrm{c}$ is equal to $\mathrm{p}(\mathrm{c})$.
Here $\mathrm{c}=1$, so the remainder will be $1^{4}-3\left(1^{2}\right)-5(1)+2=1-3-5+2=-5$
