Name: Date: Period:

Score:	First attempt due:
	Final corrections due:

Practice Worksheet:
Polynomial Long Division

Answer each question using the work shown in the box below.

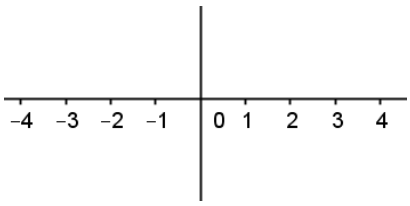
1] Write the standard form of the original polynomial.

$$x+3 \overline{)\, x^3+3x^2-x-3} \qquad x^2-1$$

2] Write the factored form of the original polynomial.

3] Identify all zeros of the original polynomial.

4] Sketch the graph of the original polynomial.



Find the missing information in each problem using the work shown.

5]

$$\begin{array}{r} \\ x-4 \overline{)\, x^3+2x^2-6x+12} \\ -(x^3-4x^2) \\ \hline 6x^2-6x+12 \\ -(6x^2-24x) \\ \hline 18x+12 \\ -(18x-72) \\ \hline 84 \end{array}$$

6]

$$\begin{array}{r} x^2-x-3 \\ \square\, \overline{)\, x^3+2x^2-6x+12} \\ -(x^3+3x^2) \\ \hline -x^2-6x+12 \\ -(-x^2-3x) \\ \hline -3x+12 \\ -(-3x-9) \\ \hline 21 \end{array}$$

Circle any errors in each polynomial long division and explain what the student did wrong.

7]

$$\begin{array}{r} x^2-11x+54+\frac{-180}{x-3} \\ x-3 \overline{)\, x^3-8x^2+21x-18} \\ x^3-3x^2 \\ \hline -11x^2+21x-18 \\ -11x^2+33x \\ \hline 54x-18 \\ 54x-162 \\ \hline -180 \end{array}$$

8]

$$\begin{array}{r} x^3+4x^2+7x+\frac{17}{x-2} \\ x-2 \overline{)\, x^4+2x^3-x^2+3} \\ -(x^4-2x^3) \\ \hline 4x^3-x^2+3 \\ -(4x^3-8x^2) \\ \hline 7x^2+3 \\ -(7x^2-14) \\ \hline 17 \end{array}$$

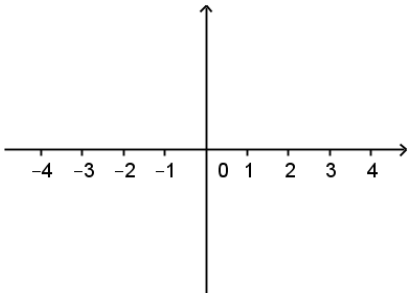
Use long division to find the quotient. Show all work.

9] $(10x^2+19x-25) \div (x+3)$

10] $(x^3-19x-30) \div (x-5)$

Use long division to rewrite f(x) in factored form and find all zeros. Then sketch the graph. Show all work.

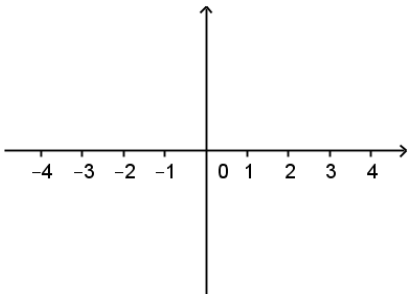
11] $f(x) = x^4 - 4x^3 - 6x^2 + 36x - 27$ has a factor of $(x - 3)$ with multiplicity two.



Factored Form:

Zeros:

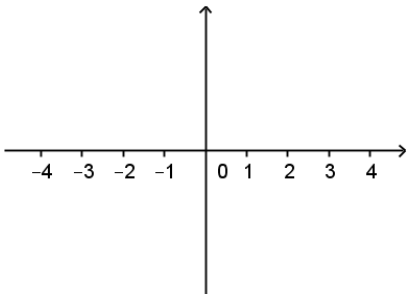
12] $f(x) = 2x^3 - 3x^2 - 14x + 15$ has factors of $(x - 1)$ and $(x - 3)$.



Factored Form:

Zeros:

BONUS: $f(x) = -x^5 + 7x^4 - 9x^3 - 27x^2 + 54x$ has a factor of $(x - 3)$ with multiplicity 3.



Factored Form:

Zeros: