Name: Sol'n

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Polynomial Functions – Mid Unit Quiz (Formative)

1. Complete the table below for the function $f(x) = -3x^4 - 6x^2 + 21x - 8$

Maximum number of turning points	3 ✓
Maximum number of x-intercepts	4 ✓
End Behaviours	as $x \to -\infty$, $y \to -\infty$ as $x \to \infty$, $y \to -\infty$ ✓

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2. Divide the following:

a) $(x^4 + 3x^2 - 2x + 5) \div (x - 1)$

	1	0	3	-2	5
1		1	1	4	2
	1	1	4	2	7

$= x^3 + x^2 + 4x + 2$, R7 ✓ ✓

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b) $(x^4 + 2x^2 - 3x - 1) \div (x^2 + 1)$

$x^2 + 1$, R $-3x - 2$ ✓ ✓

$x^2 + 0x + 1 \overline{)\, x^4 + 0x^3 + 2x^2 - 3x - 1}$

$x^4 + 0x^3 + x^2$

$x^2 - 3x - 1$

$x^2 + 0x + 1$

$-3x - 2$

3. Determine the x-intercepts, y-intercept, and end behaviours. Sketch the function.

$f(x) = -2x^3 - 6x^2 + 8$

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

$g(x)$

$g(1) = 0$

$\therefore x - 1$ is a factor

	1	3	0	-4
1		1	4	4
	1	4	4	0

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

$f(x) = -2(x-1)(x+2)^2$

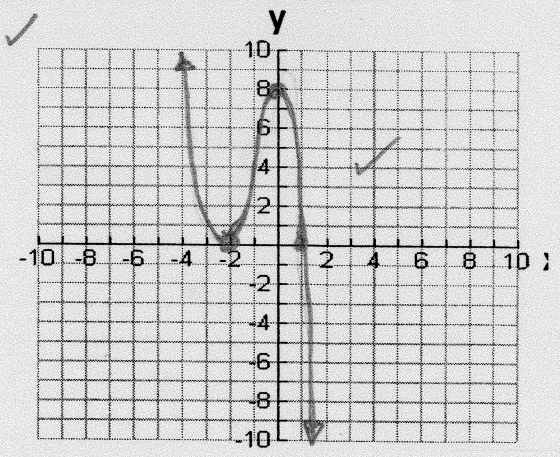
x - intercepts: 1 & -2 ✓

y – intercept: 8 ✓

end behaviours:

as $x \to -\infty$, $y \to \infty$

as $x \to \infty$, $y \to -\infty$ ✓



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4. Solve the following polynomial equation: $x^3 + 2x^2 = 9x + 18$

Grouping! $\frac{2}{1} = 2$ $\frac{-18}{-9} = 2$

$x^3 + 2x^2 - 9x - 18 = 0$

$x^2(x+2) - 9(x+2) = 0$ ✓

$(x^2 - 9)(x+2) = 0$

$(x-3)(x+3)(x+2) = 0$ ✓

$x = \pm 3, -2$

✓ ✓