Bellwork Alg 2 Tuesday, December 10, 2019

Simplify each by factoring numerator and denominator completely then canceling common factors.

1. $\dfrac{12x^4 - 108x^2}{32x^3 - 80x^2 - 48x}$

2. $\dfrac{3x^4 + 15x^3 - 12x^2 - 60x}{6x^6 - 174x^4 + 600x^2}$

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1. $\dfrac{12x^4 - 108x^2}{32x^3 - 80x^2 - 48x}$

$12x^2(x^2-9) = 12x^2(x+3)(x-3)$

$16x(2x^2 - 5x - 3) = 16x(2x+1)(x-3)$

-6, -6, $+1$, -5

	x	-3
$2x$	$2x^2$	$-6x$
$+1$	$+x$	-3

$= \dfrac{3\,12x^{\cancel{2}}\overset{x}{\cancel{x}}(x+3)\cancel{(x-3)}}{4\,16\cancel{x}(2x+1)\cancel{(x-3)}}$

$= \boxed{\dfrac{3x(x+3)}{4(2x+1)}}$

2. $\dfrac{3x^4 + 15x^3 - 12x^2 - 60x}{6x^6 - 174x^4 + 600x^2}$

$3x(x^3 + 5x^2 - 4x - 20) \Rightarrow$

	x	$+5$
x^2	x^3	$+5x^2$
-4	$-4x$	-20

$= 3x(x+5)(x^2-4)$

$= 3x(x+5)(x+2)(x-2)$

$6x^2(x^4 - 29x^2 + 100) \Rightarrow$ 100, -4, -25, -29

$= 6x^2(x^2-25)(x^2-4)$

	x^2	-25
x^2	x^4	$-25x^2$
-4	$-4x^2$	$+100$

$= 6x^2(x+5)(x-5)(x+2)(x-2)$

$= \dfrac{1\,\cancel{3x}(x+5)\cancel{(x+2)(x-2)}}{2\,\cancel{6x^2}(x+5)(x-5)\cancel{(x+2)(x-2)}}$

$= \boxed{\dfrac{1}{2x(x-5)}}$