

Factor each completely.

1.  $3x^6 - 243x^2$

2.  $8x^2 - 10x - 3$

3.  $6x^5 - 96x^3 + 378x$

1.  $3x^6 - 243x^2$

$$3x^2(x^4 - 81)$$

This is the difference of perfect squares which factors into  $(x^2+9)(x^2-9)$

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

The sum of perfect squares doesn't factor any further

The difference of perfect squares can factor further

$$3x^2(x^2+9)(x \pm 3)$$

2.  $8x^2 - 10x - 3$

No GCF, go right to the X and Box.

$$\begin{array}{cc} & -24 \\ +2 & \times & -12 \\ & -10 \end{array}$$

	$4x$	$+1$
$2x$	$8x^2$	$+2x$
$-3$	$-12x$	$-3$

$$(2x-3)(4x+1)$$

3.  $6x^5 - 96x^3 + 378x$

$$= 6x(x^4 - 16x^2 + 63)$$

$$= 6x(x^2-9)(x^2-7) = 6x(x \pm 3)(x^2-7)$$

$$\begin{array}{cc} & +63 \\ -9 & \times & -7 \\ & -16 \end{array}$$

	$x^2$	$-9$
$x^2$	$x^4$	$-9x^2$
$-7$	$-7x^2$	$+63$