## Factor Completely #1

We always want to simplify completely

- which means we may need to factor more than once

Hints: look for a GCF first, then identify the # of terms and type of factoring possible

**Factor completely** 

a)  $24x^4 - 54x^2$ 

GCF 
$$6x^2$$
  $6x^2(4x^2-9)$   $\rightarrow$   $6x^2(2x-3)(2x+3)$ 
Difference of squares

Don't forget the GCF in your answer (2x - 3)(2x + 3) is wrong without it 2

b) 
$$3x^3 - 15x^2 - 42x$$
  
GCF  $3x$   $3x(x^2 - 5x - 14)$   $\Rightarrow$   $3x(x - 7)(x + 2)$   
2 #'s x -14 add -5 ... -7 x 2

c) 
$$x^4 - 625y^4$$

$$(x^2 - 25y^2)(x^2 + 25y^2)$$
This factors again  $\Rightarrow (x - 5y)(x + 5y)(x^2 + 25y^2)$ 

d) 
$$30x^3 - 65x^2 - 25x$$

GCF of 
$$5x 5x(6x^2 - 13x - 5)$$

This factors again with decomp

Difference of squares

but that 5x will get in the way... so just remember it for final answer

$$6x^{2} - 13x - 5$$

$$6x^{2} - 15x + 2x - 5$$

$$-30 = -15 \times 2$$

$$3x(2x - 5) + 1(2x - 5)$$

$$\Rightarrow 5x(2x - 5)(3x + 1)$$

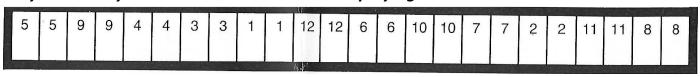
e) 
$$x^4 - 3x^2 - 4$$
  
No GCF but  $-4 \times 1 = -4$ ,  $-4 + 1 = -3$   
 $(x^2 - 4)(x^2 + 1) \rightarrow (x - 2)(x + 2)(x^2 + 1)$ 

Assignment = worksheet

## Factor Completely Day 1

The following question will take at least 2 steps. Reduce all answers to simplest form

Why doesn't Gyro bet on Even numbers when playing Roulette?



1)  $3x^2 - 75$ 

2)  $5x^2 + 30x + 45$ 

Answers

LO  $5(x-4)^2$  SF  $5(x+3)^2$ EL  $2(x-12)^2$  NT  $2(x-6)^2$ HE 3(x+5)(x-5) CH 3(x+2)(x-2)EA x(x+8)(x-8) ST x(x+7)(x-7)

3)  $x^3 - 49x$ 

4)  $2x^2 - 24x + 72$ 

5)  $2k^3 - 8k$ 

6)  $54k^2 - 24$ 

7)  $5k^3 + 100k^2 + 500k$ 

(IN)  $2b^2(4a + 1)^2$ 

8)  $12k^2 - 36k + 27$ 

9)  $7a^3b - 7ab^3$ 

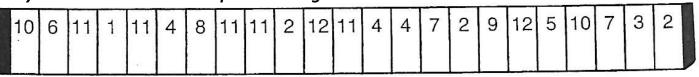
10)  $32a^2b^2 + 16ab^2 + 2b^2$ 

11)  $4a^3b - 40a^2b^2 + 100ab^3$ 

12)  $4a^4b^3 - a^2b$ 

(WA) 7ab(a+b)(a-b)

## Why are small balloons cheaper than large balloons?



1)  $a^2 - 9ab + 20b^2$ 

3)  $7a^2 - 28b^2$ 

2)  $3a^2 + 6ab - 24b^2$ 

4)  $4a^2 + 14ab + 12b^2$ 

6)  $a^3b - ab^3$ 

## Answers:

- F) 5(3x + 10y)(x y)
- $\mathsf{K}) \ 2\mathsf{x}(\mathsf{x} + 7\mathsf{y})(\mathsf{x} + 2\mathsf{y})$
- $\bigcirc$  2xy(2x + 5y)(2x 5y)
- D) 5(3x 2y)(x 5y)
- $(T) x^2(x+5y)(x+7y)$
- (U)  $3x^2(5x-2y)(x-y)$
- $(P) x^2(x+5y)(x-9y)$
- (E)  $3x^2(5x + y)(x 2y)$
- (W) x(9x+y)(x-y)
- $\bigcirc$  7(a+4b)(a+b)
- (A) a(a-7b)(a+3b)
- $\bigcirc$  7(a + 2b)(a 2b)
- (a-4b)(a-5b)
- (T) a(a + 21)(a 1)
- H ab(a+b)(a-b)
- (M) 3(a-8b)(a-b)
- (C) 2(2a 6b)(a + b)
- (N) 3(a + 4b)(a 2b)
- (V) ab(a + 3b)(a 2b)
- (S) 2(2a + 3b)(a + 2b)

7)  $2x^3 - 12x^2y - 14xy^2$ 

5)  $a^3 - 4a^2b - 21ab^2$ 

- 8)  $9x^3 6x^2y + xy^2$
- $15x^2 + 35xy 50y^2$

- 10)  $x^4 + 12x^3y + 35x^2y^2$
- 11)  $15x^4 27x^3y 6x^2y^2$  12)  $8x^3y 50xy^3$