

A last look at factoring ...

We will take one further look at factoring completely ...
 These 6 examples will again illustrate the process

Factor completely

a) $x^3 + 14x^2 - 72x$

GCF $x(x^2 + 14x - 72)$
 2 #'s $x - 72, +14 (18x - 4)$ $\rightarrow x(x + 18)(x - 4)$

b) $5x^9 - 80x^5$

GCF $5x^5(x^4 - 16)$
 Difference of squares $\rightarrow 5x^5(x^2 - 4)(x^2 + 4)$
 Difference of squares $\rightarrow 5x^5(x - 2)(x + 2)(x^2 + 4)$



c) $441x^2 - 210x - 56$

441 ... Oh my ...
 GCF $7(63x^2 - 30x - 8)$
 $63x^2 - 42x + 12x - 8$
 $-504 = -42 \times 12$
 $21x(3x - 2) + 3(3x - 2)$
 $\rightarrow 7(3x - 2)(21x + 3)$

d) $2x^3 + 5x^2 - 50x - 125$

Grouping: $x^2(2x + 5) - 25(2x + 5)$
 $(2x + 5)(x^2 - 25)$
 Difference of squares $\rightarrow (2x + 5)(x - 5)(x + 5)$

e) $x^{16} - 1$

Difference of squares $(x^8 - 1)(x^8 + 1)$
 Difference of squares $(x^4 - 1)(x^4 + 1)(x^8 + 1)$
 $(x^2 - 1)(x^2 + 1)(x^4 + 1)(x^8 + 1)$
 **Again! ... Do it again!**
 $\rightarrow (x - 1)(x + 1)(x^2 + 1)(x^4 + 1)(x^8 + 1)$

f) $4x^2(x^2 - 9) - 81(x^2 - 9)$

GCF $(x^2 - 9)(4x^2 - 81)$
 Difference of squares $\rightarrow (x - 3)(x + 3)(2x - 9)(2x + 9)$

Assignment = worksheet

Factor Completely Day 2

For the following questions, most will take at least 2 steps. Reduce all answers to simplest form

Old Lawyers Never Die, They Just

$\frac{14}{14} \frac{12}{12} \frac{5}{4} \frac{4}{4} \frac{1}{1} \frac{10}{10} \frac{4}{4} \frac{7}{7} \frac{9}{9} \frac{2}{2} \frac{13}{13} \frac{13}{13} \frac{4}{4} \frac{2}{2} \frac{14}{14}$

Old Skiers Never Die, They Just

$\frac{8}{8} \frac{12}{12} \frac{3}{3} \frac{12}{12} \frac{6}{6} \frac{11}{11} \frac{10}{10} \frac{7}{7} \frac{14}{14} \frac{14}{14}$

1) $2x^2 + 22x + 36$

3) $18x^3 - 98x$

2) $5x^3 - 10x^2 - 40x$

4) $ax^2 - 7ax + 12a$

5) $x^4 + 8x^3 - 20x^2$

6) $3x^2 + 13x + 10$

7) $10x^3 - 25x^2 - 35x$

8) $12u^2 - 28u - 24$

9) $u^4 - 3u^2 - 4$

10) $15u^4 + 2u^3 - u^2$

11) $2u^2v - 18uv + 28v$

12) $12u^3 + 36u^2 + 27u$

13) $40u^2 + 15u - 55$

14) $u^4 - 10u^2 + 9$

Answers

- | | |
|------------------------|----------------------------------|
| Ⓒ $(3x + 5)(x - 2)$ | Ⓗ $u^2(5u - 1)(3u + 1)$ |
| Ⓘ $5x(2x - 7)(x + 1)$ | Ⓥ $3u(4u + 3)(u + 3)$ |
| Ⓙ $2(x + 2)(x + 9)$ | Ⓛ $(u + 1)(u - 1)(u + 3)(u - 3)$ |
| Ⓨ $a(x + 6)(x + 2)$ | Ⓝ $2v(u - 7)(u - 2)$ |
| Ⓢ $x^2(x + 10)(x - 2)$ | Ⓚ $4(3u + 6)(u - 1)$ |
| Ⓓ $2x(3x + 7)(3x - 7)$ | Ⓑ $(u^2 + 9)(u + 1)(u - 2)$ |
| Ⓜ $x^2(x + 4)(x - 5)$ | Ⓓ $4(3u + 2)(u - 3)$ |
| Ⓑ $2(x + 3)(x + 6)$ | Ⓜ $u^2(15u + 1)(u - 1)$ |
| Ⓐ $5x(x - 4)(x + 2)$ | Ⓟ $5(8u + 11)(u - 1)$ |
| Ⓕ $2x(9x - 7)(x + 7)$ | Ⓤ $2v(u + 14)(u + 1)$ |
| Ⓦ $(3x + 10)(x + 1)$ | Ⓡ $(u^2 + 1)(u + 2)(u - 2)$ |
| Ⓚ $5x(2x - 1)(x + 7)$ | Ⓕ $5(4u + 11)(2u + 1)$ |
| Ⓔ $a(x - 3)(x - 4)$ | Ⓞ $3u(2u + 3)^2$ |

What do you call a sore on a Police Officer's foot?

5	8	11	7	1	3	9	6	2	12	4	10
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1) $3x^2 - 15x + 18$

2) $x^3 + 11x^2 + 10x$

3) $8x^3 - 18x$

4) $5x^3 - 40x^2 + 60x$

5) $4x^2 + 8x - 60$

6) $2x^3 - 20x^2 - 48x$

7) $4m^2 - 18m + 14$

8) $15m^3 + 24m^2 + 9m$

9) $15m^2 - 10m - 25$

12) $60m^3 + 54m^2 - 6m$

10) $50m^3 - 2m$

11) $3m^2 - 10m + 8$

Answers:

(O) $3m(5m + 3)(m + 1)$

(S) $5(3m + 1)(m - 5)$

(R) $(3m - 4)(m - 2)$

(F) $2(2m + 1)(m + 7)$

(T) $5(3m - 5)(m + 1)$

(M) $6m(5m - 1)(2m - 1)$

(H) $3m(5m + 2)(m - 1)$

(N) $2(2m - 7)(m - 1)$

(P) $2m(5m + 1)(5m - 1)$

(C) $6m(10m - 1)(m + 1)$

(L) $(3m - 2)(m + 4)$

(I) $5x(x + 3)(x - 4)$

(N) $2x(2x + 3)(2x - 3)$

(L) $2x(x + 6)(x - 4)$

(O) $3(x - 2)(x - 3)$

(C) $4(x + 5)(x - 3)$

(A) $x(x + 5)(x + 3)$

(S) $4(x + 5)(x - 1)$

(E) $x(x + 10)(x + 1)$

(H) $2x(x - 12)(x + 2)$

(O) $5x(x - 2)(x - 6)$

(R) $2x(4x + 9)(x + 1)$