1. The expression $x^2(x+2) - 1(x+2)$ is equivalent to

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

1) x^2

2) $x^2 - 1$

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

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

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

2. When factored completely, the expression $3x^3 - 5x^2 - 48x + 80$ is equivalent to

$x^2(3x-5) - 16(3x-5)$

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

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

$(3x-5)(x^2-16)$

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

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

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

3. Factor completely: $x^4 - 9x^2 + x^3 - 9x - 6x^2 + 54$

$x^2(x^2-9) + x(x^2-9) - 6(x^2-9)$

$(x^2-9)(x^2+x-6)$

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

$3 \underset{1}{\overset{-6}{\times}} 2$

OR

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

4. Factor completely: $x^2 + 6x + 6 + 5x + 5x^2 + x^3$

$x^3 + x^2 + 5x^2 + 5x + 6x + 6$

$x^2(x+1) + 5x(x+1) + 6(x+1)$

$(x+1)(x^2 + \overset{A}{5}x + \overset{M}{6})$

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

$2 \underset{5}{\overset{6}{\times}} 3$

$$GCF = 3x(2x^2 + 9)$$

5. Factor completely: $9x^3(2x^2 + 9) - 3x(2x^2 + 9)^2$

$$3x(2x^2 + 9)(3x^2 - (2x^2 + 9))$$
$$3x(2x^2 + 9)(3x^2 - 2x^2 - 9)$$
$$3x(2x^2 + 9)(x^2 - 9)$$
$$\boxed{3x(2x^2 + 9)(x + 3)(x - 3)}$$

6. Factor completely: $1 - x^3$

$$= \boxed{\begin{matrix} S & O & AP \\ (1 - x)(1 & + 1x & + x^2) \end{matrix}}$$

$$a = 1 \quad b = x$$

7. Factor completely: $y^4 + 2y^2 - 3$

← DOTS

$$(y^2 + 3)(y^2 - 1) \qquad 3 \underset{2}{\overset{-3 \quad -1}{\times}}$$

$$\boxed{(y^2 + 3)(x + 1)(x - 1)}$$