

P 4.16

1. b)

$$\frac{x}{3}(5x-2) - \frac{y^2}{4}(-2+5x) + \frac{z^3}{5}(2-5x)$$

★ to make this term have the gcf, factor out a negative one

① gcf: $5x-2$

② Brackets

③ Division

$$\frac{x}{3}(5x-2) - \frac{y^2}{4}(-2+5x) + \frac{z^3}{5}(-1)(-2+5x)$$

evaluate

$$\frac{\cancel{5x-2}}{\cancel{5x-2}} \left(\frac{x}{3} - \frac{y^2}{4} - \frac{z^3}{5} \right)$$

Unit 5: Factoring a difference
of squares (binomial)

- binomial
2 terms
- each term
is a square
- presence of
a minus
sign

ex $x^2 - 25$

I ♥
FRENCH

Steps to
factor
a difference
of square

Step ①

Construct
two brackets
times each
other

Step ②: Take

the square root
of each term
individually and
put answer in both
brackets w respect
to their original
order.

Step ③ Put

a plus sign in
one bracket, a
minus sign in
the other bracket

$$x^2 - 25$$

$$(x + 5)(x - 5)$$

(check)

$$\begin{array}{l} (x-5)(x+5) \\ x^2 + 5x - 5x - 25 \\ x^2 - 25 \end{array}$$

$$\sqrt{x^2} = (x^2)^{\frac{1}{2}}$$

$$= x^{\frac{2}{2}}$$

$$= x$$

$$\sqrt{25} = 5$$

Factor

$$x^2 - 9$$

$$\frac{4p^2 - 9q^2}{\frac{x^2}{64} - \frac{y^2}{81}}$$

$$x^2 - 9$$

$$25x^2 - 49$$

$$\frac{4v^4 - 36w^2}{100 - x^6}$$

$$\textcircled{J} (x+2)^2 - x^2$$

$$\text{☺}^2 - 4$$

1

★ Look for
gcf
first

$$4v^4 - 36w^2$$

★ Is there still
a gcf?

gcf 4
2: B
3: D

$$4v^4 - 36w^2$$

$$4(v^4 - 9w^2)$$

$$4(v^2 + 3w)(v^2 - 3w)$$

$\sqrt{v^4} = v^2$ 1: 2
 $\sqrt{9w^2} = 3w$ 2: B
 3: D

$$\left(\frac{2v^2}{2} - \frac{6w}{2}\right)\left(\frac{2v^2}{2} + \frac{6w}{2}\right)$$

$$2(v^2 - 3w)2(v^2 + 3w)$$

$$2 \cdot 2(v^2 - 3w)(v^2 + 3w)$$

$$4(v^2 - 3w)(v^2 + 3w)$$

$\sqrt{4v^4} = 2v^2$
 $\sqrt{36w^2} = 6w$
 1: gcf: 2
 2: B
 3: D

Check

$$4(v^2 + 3w)(v^2 - 3w)$$

$$(4v^2 + 12w)(v^2 - 3w)$$

$$4v^4 - 12v^2w + 12v^2w - 36w^2$$

FACTOR

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

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

$$(\cancel{x+2} - x)(\cancel{x+2} + x)$$

$$2(2x+2)$$

$$4(x+1)$$

$$\sqrt{\cancel{(x+2)^2}} \\ (x+2)$$

$$\sqrt{\cancel{x^2}} = x$$

$$18x^3 - 72x$$

$$3x^3 - 3x$$

$$\frac{1}{4}a^2 - \frac{1}{16}b^2$$

$$\frac{18x^3}{18x} - \frac{72x}{18x}$$

• $18x(x^2 - 4)$

$$18x(x+2)(x-2)$$

$$\text{gcf: } 18x$$

$$\sqrt{x^2} = x$$

$$\sqrt{4} = 2$$

$$\frac{3x^3}{3x} - \frac{3x}{3x}$$

gcf 3x

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

$$\sqrt{1} = 1$$

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

$$\frac{1}{4} a^2 - \frac{1}{16} b^2$$

$$\text{gcf } \frac{1}{4}$$

$$\frac{1}{4} \left(a^2 - \frac{1}{4} b^2 \right)$$

$$\sqrt{a^2} = a$$

$$\frac{1}{4} \left(a + \frac{1}{2} b \right) \left(a - \frac{1}{2} b \right)$$

$$\sqrt{\frac{1}{4} b^2} = \sqrt{\frac{1}{4}} \sqrt{b^2}$$

$$= \frac{\sqrt{1}}{\sqrt{4}} b$$

$$= \frac{1}{2} b$$

$$\frac{1}{16} \div \frac{1}{4}$$

$$\frac{1}{16} \times \frac{4}{1} = \frac{1}{4}$$

Unit 6 : Factoring (more complex) Polynomials

Strategy : gcf / grouping / trinomial /

- factor out a negative
- make gcf negative when 1st term is negative
- always 1st check for a gcf

• at the end double check if there's

any more factoring to

be done

- gcf
- trinomial
- difference of \square s

e.x.

$$ax^2 + bx + c$$

$$x + 2x^2 + 6$$

~~*~~ rearrange the terms.

Factor:

1) $48a^4 - 243z^8$

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

3) $4x^2 - 4$

$4(x^2 - 1)$

$\sqrt{x^2} = x$

$\sqrt{1} = 1$

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

* Rearrange binomials by putting the minus in the middle.

4) $-9z^2 + 4$
 $4 - 9z^2$

5) $3x^3 - 9x^2 - 12x$

$$1) \quad \frac{48a^4}{3} - \frac{243z^8}{3}$$

$$3(16a^4 - 81z^8)$$

$$\sqrt{16a^4} = 4a^2$$

$$\sqrt{81z^8} = 9z^4$$

1) GCF: 3

2. B

3. D

$$3(4a^2 + 9z^4)(4a^2 - 9z^4)$$

$$3(4a^2 + 9z^4)(2a + 3z^2)(2a - 3z^2)$$

$$\sqrt{4a^2} = 2a$$

$$\sqrt{9z^4} = 3z^2$$

2) $-x^2 - 4x + 5$
 $\underbrace{-1 \times 5 = -5}$

$$\begin{matrix} -5 \\ \textcircled{1 \quad -5} \\ -1 \quad 5 \end{matrix}$$

$$\frac{-x^2}{-x} - \frac{5x}{-x} + \frac{x}{1} + \frac{5}{1}$$

- 1. gcf: -x
- 2. B
- 3. D

$$\frac{-x(x+5)}{x+5} + \frac{1(x+5)}{x+5}$$

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

- 1. gcf: 1
- 2. B
- 3. D

Strategy
 factor out
 a one
 when there's
 there's nothing
 else to
 do

- 1. gcf $x+5$
- 2.