$$23$$

$$12 \overline{)277}$$
$$\underline{24} \downarrow$$
$$37$$
$$\underline{36}$$
$$1$$

$$23 \ R1$$

$$\boxed{23 \tfrac{1}{12}}$$

$$2x + 3$$

$$x+2 \overline{)2x^2 + 7x + 7}$$
$$-(2x^2 + 4x) \downarrow$$
$$3x + 7$$
$$-(3x + 6)$$
$$1$$

$$\boxed{1st}$$

✳ is dividend
      (inside)

in standard
form w/

no missing terms ✓

$$2x + 3 \ R1$$

$$\boxed{2x + 3 + \frac{1}{x+2}}$$

$$(4x^2 + 3x^3 + 10) \div (x - 2)$$

$$X-2 \overline{\big)\; 4x^2 + 3x^3 + 10}$$

$$X-2 \overline{\big)\; 3x^3 + 4x^2 + 0x + 10}$$

$$- \left(3x^3 - 6x^2\right)$$

$$\overline{} \quad 10x^2 + 0x$$

$$- \left(10x^2 - 20x\right)$$

$$\overline{} \quad 20x + 10$$

$$- \left(20x - 40\right)$$

$$\overline{} \quad 50$$

$$\boxed{3x^2 + 10x + 20 + \frac{50}{x-2}}$$

Factoring

$$x^2 - 6x + 8$$

$$\boxed{(x-2)(x-4)}$$

$$\frac{8}{\begin{array}{c}1 \cdot 8 \\ \boxed{2 \cdot 4}\end{array}}$$

$$x^2 - 16$$

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

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

$$a^2 - 25$$

$$(a+5)(a-5)$$

$$a^2 + 25$$
prime

~~~~~~~~~~~~~~~~~~~~~~~

$$x^3 + y^3$$

sum of cubes

$$\left(1st\right)^3 + \left(2nd\right)^3 = \left(1st + 2nd\right)\left(1st^2 - 1st \cdot 2nd + 2nd^2\right)$$

Same   Change   always

$$x^3 + y^3$$
$$(x)^3 + (y)^3$$

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

3

$$X^3 - X^2 y + X y^2$$
$$+ y X^2 - y^2 X + y^3$$

~~~~~~~~~~~~~~~~~~~~~~~

$$\left.\begin{array}{c} a^3 + b^3 \\ a^3 - b^3 \end{array}\right\} \Rightarrow \left(a \; \boxed{\substack{\text{same} \\ \text{sign}}} \; b\right)\left(a^2 \; \boxed{\substack{\text{change} \\ \text{sign}}} \; ab + b^2\right)$$

given ↓

Keep   change +

$$a^3 \underset{-}{+} b^3 = \left(a \underset{}{\pm} b\right)\left(a^2 \underset{-}{+} ab + b^2\right)$$

$$1^3 = 1$$
$$2^3 = 8 \; ✗$$
$$3^3 = 27 ✗$$
$$4^3 = 64 ✗$$
$$5^3 = 125 ✗$$

$$6^3 = 216$$
$$10^3 = 1000$$

Factor:

$$8 - X^3$$

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

$$\overset{\text{keep}\quad\text{change}\quad\text{+}}{(2 - x)(4 + 2x + x^2)}$$

LD: 6.3 : 2, 13, 15, 18

Factoring 6.4   5, 6, 12, 14, 20, 21, 28, 30