

Long division and factoring

Wednesday, December 20, 2017 9:50 AM

$$\begin{array}{r}
 \overline{) 23} \\
 \underline{12} \\
 11 \\
 \underline{24} \\
 37 \\
 \underline{36} \\
 1
 \end{array}$$

$$\begin{array}{r}
 23 \text{ R } 1 \\
 \hline
 23 \frac{1}{12}
 \end{array}$$

$$\begin{array}{r}
 \overline{) 2x^2 + 7x + 7} \\
 \underline{2x^2 + 4x} \\
 3x + 7 \\
 \underline{3x + 6} \\
 1
 \end{array}$$

1st

* is dividend (inside)
in standard form w/
no missing terms ✓

$$\begin{array}{r}
 2x+3 \text{ R } 1 \\
 \hline
 2x+3 + \frac{1}{x+2}
 \end{array}$$

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

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

$$3x^2 + 10x + 20$$

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

$$- (3x^3 - 6x^2) \downarrow$$

$$10x^2 + 0x$$

$$- (10x^2 - 20x) \downarrow$$

$$20x + 10$$

$$- (20x - 40)$$

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

Check standard. do something ✓

Factoring

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

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

$$\begin{array}{r} 8 \\ 1 \cdot 8 \\ \hline 2 \cdot 4 \end{array}$$

$$\sqrt{x^2 - 16} = (x+4)(x-4)$$

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

$$a^2 - 25$$

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

$$a^2 + 25$$

prime

$$x^3 + y^3$$

sum of cubes

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

↑ Same ↑ change ↑ always

$$x^3 + y^3$$

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

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

2

$$\begin{aligned}
 & X^3 - X^2Y + XY^2 \\
 & + YX^2 - Y^2X + Y^3
 \end{aligned}$$

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

$$\begin{array}{c} \text{given} \\ \downarrow \\ a^3 \text{ - } b^3 \end{array} = \begin{array}{c} \text{keep} \\ (a \text{ - } b) \end{array} \begin{array}{c} \text{change +} \\ (a^2 \text{ + } ab + b^2) \end{array}$$

$$1^3 = 1$$

$$2^3 = 8 \times$$

$$3^3 = 27 \times$$

$$4^3 = 64 \times$$

$$5^3 = 125 \times$$

$$6^3 = 216$$

$$10^3 = 1000$$

Factor:

$$8 - X^3$$

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

$$\begin{array}{ccc} \text{keep} & \text{change} & + \\ (2 - x)(4 + 2x + x^2) \end{array}$$

LD: 6.3 : 2, 13, 15, 18

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