

p. 316 #2:

$$x=0, x=0.168, x=4.732$$

# 4: graphical

$$\# 6: x=-2, x=1, x=5$$

$$\# 8: x=0, x=1$$

Topic: polynomial long division.

$$(1) P(x) \div Q(x)$$

$$(2) P(x) \swarrow Q(x)$$

$$(3) \frac{P(x)}{Q(x)}$$

All 3 mean the same thing.

answer with possible  
remainder

$$Q(x) \overline{) P(x)}$$

Ex #1  $4x^2 + 23x - 16 \div x + 5$

Setup:

$$\overbrace{4x(x+5)}$$

$$x+5 \overline{) 4x^2 + 23x - 16}$$

$$\underline{4x^2 + 20x}$$

$$3x - 16$$

$$\underline{3x + 15}$$

$$-31 \text{ rem}$$

check:  $(x+5)(4x+3)$

$$4x^2 + 3x + 20x + 15$$

$$4x^2 + 23x + 15$$

$$\underline{\hspace{10em} -31}$$

$$4x^2 + 23x - 16$$

Q: What if the remainder is zero?

we found factors of  $P(x)$

$$\text{Ex. } 3x^2 - 29x + 56 \div x - 7$$

$$\begin{array}{r} \phantom{x-7} \overline{) 3x^2 - 29x + 56 = P(x)} \\ \underline{3x^2 - 21x} \phantom{+ 56} \\ -8x + 56 \\ \underline{-8x + 56} \\ 0 \text{ rem} \end{array}$$

$3x - 8 \text{ R}0$

$x - 7$  is a factor of  $P(x)$

7 is a zero of  $P(x)$

$3x - 8$  is a factor of  $P(x)$

$\frac{8}{3}$  is a zero of  $P(x)$

$$\begin{aligned} P(x) &= (x-7)(3x-8) \\ &= 0 \cdot (14) \\ &= 0 \end{aligned}$$

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twins born 2 years  
after sister  
product of ages is 4558  
more than sum

$x$  = age of 1<sup>st</sup> twin

$x$  = " " 2<sup>nd</sup> "

$x+2$  = sister's age

product = sum + 4558

⋮

$$\begin{array}{l} x^2(x+2) \\ \cancel{x^3+2x^2} \end{array}$$

$$\begin{array}{l} x+x+x+2 \\ \cancel{3x+2} \end{array}$$

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product of 3 consecutive  
integers is 210

$x$  = 1<sup>st</sup> integer

$x+1$  = 2<sup>nd</sup> "

$x+2$  = 3<sup>rd</sup> "

$x(x+1)(x+2)$   
divide and conquer!

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

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