

I'm not robot!

$$\begin{array}{r}
 x + 2 \overline{) 2x^3 - 3x^2 + 4x + 5} \\
 \underline{2x^3} \phantom{- 3x^2 + 4x + 5} \\
 0x^3 + 0x^2 + 4x + 5 \\
 \underline{4x} \phantom{+ 5} \\
 0x^3 + 0x^2 + 0x + 5 \\
 \underline{5} \\
 0
 \end{array}$$

Set up the division problem.

$$\begin{array}{r}
 x + 2 \overline{) 2x^3 - 3x^2 + 4x + 5} \\
 \underline{2x^3} \phantom{- 3x^2 + 4x + 5} \\
 0x^3 + 0x^2 + 4x + 5 \\
 \underline{4x} \phantom{+ 5} \\
 0x^3 + 0x^2 + 0x + 5 \\
 \underline{5} \\
 0
 \end{array}$$

$2x^3$  divided by  $x$  is  $2x^2$ .

$$\begin{array}{r}
 x + 2 \overline{) 2x^3 - 3x^2 + 4x + 5} \\
 \underline{2x^3} \phantom{- 3x^2 + 4x + 5} \\
 0x^3 + 0x^2 + 4x + 5 \\
 \underline{4x} \phantom{+ 5} \\
 0x^3 + 0x^2 + 0x + 5 \\
 \underline{5} \\
 0
 \end{array}$$

Multiply  $x + 2$  by  $2x^2$ .

$$\begin{array}{r}
 x + 2 \overline{) 2x^3 - 3x^2 + 4x + 5} \\
 \underline{2x^3} \phantom{- 3x^2 + 4x + 5} \\
 0x^3 + 0x^2 + 4x + 5 \\
 \underline{4x} \phantom{+ 5} \\
 0x^3 + 0x^2 + 0x + 5 \\
 \underline{5} \\
 0
 \end{array}$$

Subtract.

$$\begin{array}{r}
 x + 2 \overline{) 2x^3 - 3x^2 + 4x + 5} \\
 \underline{2x^3} \phantom{- 3x^2 + 4x + 5} \\
 0x^3 + 0x^2 + 4x + 5 \\
 \underline{4x} \phantom{+ 5} \\
 0x^3 + 0x^2 + 0x + 5 \\
 \underline{5} \\
 0
 \end{array}$$

Bring down the next term.

$$\begin{array}{r}
 x + 2 \overline{) 2x^3 - 3x^2 + 4x + 5} \\
 \underline{2x^3} \phantom{- 3x^2 + 4x + 5} \\
 0x^3 + 0x^2 + 4x + 5 \\
 \underline{4x} \phantom{+ 5} \\
 0x^3 + 0x^2 + 0x + 5 \\
 \underline{5} \\
 0
 \end{array}$$

$-7x^2$  divided by  $x$  is  $-7x$ .

$$\begin{array}{r}
 x + 2 \overline{) 2x^3 - 3x^2 + 4x + 5} \\
 \underline{2x^3} \phantom{- 3x^2 + 4x + 5} \\
 0x^3 + 0x^2 + 4x + 5 \\
 \underline{4x} \phantom{+ 5} \\
 0x^3 + 0x^2 + 0x + 5 \\
 \underline{5} \\
 0
 \end{array}$$

Multiply  $x + 2$  by  $-7x$ .

$$\begin{array}{r}
 x + 2 \overline{) 2x^3 - 3x^2 + 4x + 5} \\
 \underline{2x^3} \phantom{- 3x^2 + 4x + 5} \\
 0x^3 + 0x^2 + 4x + 5 \\
 \underline{4x} \phantom{+ 5} \\
 0x^3 + 0x^2 + 0x + 5 \\
 \underline{5} \\
 0
 \end{array}$$

Subtract. Bring down the next term.

$$\begin{array}{r}
 x + 2 \overline{) 2x^3 - 3x^2 + 4x + 5} \\
 \underline{2x^3} \phantom{- 3x^2 + 4x + 5} \\
 0x^3 + 0x^2 + 4x + 5 \\
 \underline{4x} \phantom{+ 5} \\
 0x^3 + 0x^2 + 0x + 5 \\
 \underline{5} \\
 0
 \end{array}$$

$18x$  divided by  $x$  is  $18$ .

$$\begin{array}{r}
 x + 2 \overline{) 2x^3 - 3x^2 + 4x + 5} \\
 \underline{2x^3} \phantom{- 3x^2 + 4x + 5} \\
 0x^3 + 0x^2 + 4x + 5 \\
 \underline{4x} \phantom{+ 5} \\
 0x^3 + 0x^2 + 0x + 5 \\
 \underline{5} \\
 0
 \end{array}$$

Multiply  $x + 2$  by  $18$ .

$$\begin{array}{r}
 x + 2 \overline{) 2x^3 - 3x^2 + 4x + 5} \\
 \underline{2x^3} \phantom{- 3x^2 + 4x + 5} \\
 0x^3 + 0x^2 + 4x + 5 \\
 \underline{4x} \phantom{+ 5} \\
 0x^3 + 0x^2 + 0x + 5 \\
 \underline{5} \\
 0
 \end{array}$$

Subtract.

- Division of Polynomials Using Synthetic Division
- Use synthetic division to find the quotient and remainder when:
- $4x^3 - 3x^2 + 8x + 4$  divided by  $x - 2$
  - $3x^4 - 6x^2 - 5x + 10$  divided by  $x - 2$
  - $x^3 - x^2 + 2x + 4$  divided by  $x - 2$
  - $3x^3 + 2x^2 - x + 3$  divided by  $x - 3$
  - $x^5 - 4x^3 + 1$  divided by  $x + 3$
  - $4x^5 - 3x^4 + x^2 + 5$  divided by  $x - 1$
  - $x^5 - 1$  divided by  $x - 1$
  - $2x^3 - x^2 + 3$  divided by  $x - 3$
  - $x^2 + x^2 - 5$  divided by  $x - 3$
  - $2x^5 + 5x^4 - 2x^3 + 2x^2 - 2x + 3$  divided by  $x + 3$

Polynomials: Concepts and Synthetic Division

The following are results of synthetic division from the function  $Q(x)$  and selected linear binomials...

|   |  |
|---|--|
| $  \begin{array}{r}  -5 \\  \hline  1 \quad -8 \quad 41 \quad -220 \quad   \quad 1080  \end{array}  $ | $  \begin{array}{r}  1 \\  \hline  1 \quad -2 \quad -1 \quad -16 \quad   \quad -36  \end{array}  $ |
| $  \begin{array}{r}  -4 \\  \hline  1 \quad -7 \quad 29 \quad -131 \quad   \quad 504  \end{array}  $  | $  \begin{array}{r}  2 \\  \hline  1 \quad -1 \quad -1 \quad -17 \quad   \quad -54  \end{array}  $ |
| $  \begin{array}{r}  -3 \\  \hline  1 \quad -6 \quad 19 \quad -72 \quad   \quad 196  \end{array}  $   | $  \begin{array}{r}  3 \\  \hline  1 \quad 0 \quad 1 \quad -12 \quad   \quad -56  \end{array}  $   |
| $  \begin{array}{r}  -2 \\  \hline  1 \quad -5 \quad 11 \quad -37 \quad   \quad 54  \end{array}  $    | $  \begin{array}{r}  4 \\  \hline  1 \quad 1 \quad 5 \quad 5 \quad   \quad 0  \end{array}  $       |
| $  \begin{array}{r}  -1 \\  \hline  1 \quad -4 \quad 5 \quad -20 \quad   \quad 0  \end{array}  $      | $  \begin{array}{r}  5 \\  \hline  1 \quad 2 \quad 11 \quad 40 \quad   \quad 180  \end{array}  $   |

- What is  $Q(3)$ ?
- Find  $\frac{Q(x)}{x+2}$
- Find the equation of the polynomial  $Q(x)$  in *standard form*.
- Write the equation of the polynomial as a product of linear factors (or factored form)

**Long division calculations**

Use **long division** to calculate the answers to these questions.

- $48 \overline{) 576}$
- $33 \overline{) 627}$
- $35 \overline{) 8050}$
- $35 \overline{) 9380}$
- $13 \overline{) 7436}$
- $38 \overline{) 9728}$

# Computation with Polynomials:

## Division

Divide each polynomial

1)  $x - 8 \overline{)x^2 - 13x + 40}$

5)  $x - 2 \overline{)3x^2 - 5x - 22}$

2)  $4x - 5 \overline{)12x^2 - 39x + 30}$

6)  $x - 3 \overline{)7x^2 + 25x + 12}$

3)  $7x + 3 \overline{)14x^2 + 69x + 27}$

7)  $x^2 - 9 \overline{)5x^3 + 4x^2 - 45x - 36}$

4)  $3x + 1 \overline{)6x^3 + 23x^2 + 10x + 1}$

8)  $5x^2 + 2 \overline{)5x^4 - 45x^3 + 52x^2 - 18x + 20}$



Math worksheets and visual curriculum A: Concepts Exercise  $\left(\frac{\text{PageIndex}{A}}{\right)}$  1) If division of a polynomial by a binomial results in a remainder of zero, what can be conclude? 2) If a polynomial of degree  $\left(\left(n\right)\right)$  is divided by a binomial of degree  $\left(\left(1\right)\right)$ , what is the degree of the quotient? Answers to odd exercises: 1. The binomial is a factor of the polynomial. B: Perform Polynomial Long Division Exercise  $\left(\frac{\text{PageIndex}{B}}{\right)}$   $\left(\left(\text{bigstar}\right)\right)$  Use long division to divide. Also specify the quotient and the remainder. 3)  $\left(\left(x^2+5x-1\right)+\left(x-1\right)\right)$  4)  $\left(\left(2x^2-9x-5\right)+\left(x-5\right)\right)$  5)  $\left(\left(3x^2+23x+14\right)+\left(x+7\right)\right)$  6)  $\left(\left(4x^2-10x+6\right)+\left(4x+2\right)\right)$  7)  $\left(\left(6x^2-25x-25\right)+\left(6x+5\right)\right)$  8)  $\left(\left(-x^2-1\right)+\left(x+1\right)\right)$  9)  $\left(\left(2x^2-3x+2\right)+\left(x+2\right)\right)$  10)  $\left(\left(x^3-126\right)+\left(x-5\right)\right)$  11)  $\left(\left(3x^2-5x+4\right)+\left(3x+1\right)\right)$  12)  $\left(\left(x^3-3x^2+5x-6\right)+\left(x-2\right)\right)$  13)  $\left(\left(2x^3+3x^2-4x+15\right)+\left(x+3\right)\right)$   $\left(\left(\text{bigstar}\right)\right)$  Divide. 14)  $\left(\left(\frac{\text{frac}{x^3-5x^2+x+15}}{x-3}\right)\right)$  15)  $\left(\left(\frac{\text{frac}{y^3-4y^2+6y-4}}{y-2}\right)\right)$  16)  $\left(\left(\frac{\text{frac}{x^5+3x^2+x^3+2x+1}}{x^3+2x+1}\right)\right)$  17)  $\left(\left(\frac{\text{frac}{2z^3+5z+8}}{z+1}\right)\right)$  18)  $\left(\left(\frac{\text{frac}{3x^5-4x^3+3x^2+12x-10}}{x^2+2x-1}\right)\right)$  19)  $\left(\left(\frac{\text{frac}{2y^5-3y^4-y^2+y+4}}{y^2+y+1}\right)\right)$  20)  $\left(\left(\frac{\text{frac}{3y^3-4y^2-3}}{y^2+5y+2}\right)\right)$  21)  $\left(\left(\frac{\text{frac}{5x^4-3x^2+2}}{x^2-3x+5}\right)\right)$  Answers to odd exercises: 3.  $\left(\left(\text{mathrm}{x+6+\frac{\text{frac}{5}}{x-1}}\right)\right)$ , quotient:  $x+6$ , remainder:  $5$ ) 5.  $\left(\left(\text{mathrm}{3x+2}\right)\right)$ , quotient:  $3x+2$ , remainder:  $0$ ) 7.  $\left(\left(\text{mathrm}{x-5}\right)\right)$ , quotient:  $x-5$ , remainder:  $0$ ) 9.  $\left(\left(\text{mathrm}{2x-7+\frac{\text{frac}{16}}{x+2}}\right)\right)$ , quotient:  $2x-7$ , remainder:  $16$ ) 11.  $\left(\left(\text{mathrm}{x-2+\frac{\text{frac}{3x+1}}{x+1}}\right)\right)$ , quotient:  $x-2$ , remainder:  $6$ ) 13.  $\left(\left(\text{mathrm}{2x^2-3x+5}\right)\right)$ , quotient:  $2x^2-3x+5$ , remainder:  $0$ ) 15.  $\left(\left(y^2-2y+2\right)\right)$  17.  $\left(\left(2z^2-2z+7+\frac{\text{frac}{1}}{z+1}\right)\right)$  19.  $\left(\left(2y^3-3y^2-2y+2+\frac{\text{frac}{3y+2}}{y^2+1}\right)\right)$  21.  $\left(\left(5x^2+15x+17+\frac{\text{frac}{-24x-83}}{x^2-3x+5}\right)\right)$  C: Use Long Division to Rewrite a Polynomial Exercise  $\left(\frac{\text{PageIndex}{C}}{\right)}$   $\left(\left(\text{bigstar}\right)\right)$  Use polynomial long division to perform the indicated division. Write the polynomial dividend in the form  $\left(\left(p(x)=d(x)q(x)+r(x)\right)\right)$ . 23.  $\left(\left(\frac{\text{frac}{4x^2+3x-1}}{x-3}\right)\right)$  24)  $\left(\left(\frac{\text{frac}{x^3-4x^2-3x-10}}{x^2+x+2}\right)\right)$  25.  $\left(\left(\frac{\text{frac}{2x^3+x+1}}{x^2+x+2}\right)\right)$  26)  $\left(\left(\frac{\text{frac}{2x^3-3x^2+7x-3}}{x^2+x+3}\right)\right)$  27.  $\left(\left(\frac{\text{frac}{5x^4-3x^3+2x^2-1}}{x^2+2x-1}\right)\right)$  28)  $\left(\left(\frac{\text{frac}{x^4+2x^3-x^2+x+6}}{x^2+x+6}\right)\right)$  29.  $\left(\left(\frac{\text{frac}{x^5+7x^3-x}}{x^2-x}\right)\right)$  30)  $\left(\left(\frac{\text{frac}{x^4+x^3+5x^2+3x+6}}{x^2+x-1}\right)\right)$  31.  $\left(\left(\frac{\text{frac}{9x^3+5}}{x^2-x-1}\right)\right)$  Answers to odd exercises: 23.  $\left(\left(4x^2+3x-1=(x-3)(4x+5)+4\right)\right)$  25.  $\left(\left(2x^3+x+1=\left(x^2+x+1\right)(2x+(-x+3))\right)\right)$  27.  $\left(\left(5x^4-3x^3+2x^2-1=\left(x^2+4\right)\left(5x^2-3x-18\right)+\left(12x+7\right)\right)\right)$  29.  $\left(\left(-x^5+7x^3-x=\left(x^3-x^2+1\right)\left(-x^2-x+6\right)+\left(7x^2-6\right)\right)\right)$  31.  $\left(\left(9x^3+5=\left(2x-3\right)\left(\frac{\text{frac}{9}}{2x-3}+\frac{\text{frac}{27}}{2}\right)\right)\right)$  33.  $\left(\left(4x^2-x-23=\left(x^2-1\right)(4x+(-x-19))\right)\right)$  D: Perform Synthetic Division Exercise  $\left(\frac{\text{PageIndex}{D}}{\right)}$   $\left(\left(\text{bigstar}\right)\right)$  Use synthetic division to divide. Also state the quotient and remainder. 35)  $\left(\left(\frac{\text{frac}{4x^3-33}}{x-2}\right)\right)$  36)  $\left(\left(\frac{\text{frac}{2x^3+25}}{x+3}\right)\right)$  37)  $\left(\left(\frac{\text{frac}{3x^3+2x-5}}{x-1}\right)\right)$  38)  $\left(\left(\frac{\text{frac}{-4x^3-x^2-12}}{x+4}\right)\right)$  39)  $\left(\left(\frac{\text{frac}{x^4-22}}{x+2}\right)\right)$   $\left(\left(\text{bigstar}\right)\right)$  For the exercises below, use synthetic division to find the quotient. 40)  $\left(\left(\frac{\text{frac}{3x^3-2x^2+x-4}}{x+3}\right)\right)$  41)  $\left(\left(\frac{\text{frac}{2x^3-6x^2-7x+6}}{x-4}\right)\right)$  42)  $\left(\left(\frac{\text{frac}{6x^3-10x^2-7x-15}}{x+1}\right)\right)$  43)  $\left(\left(\frac{\text{frac}{4x^3-12x^2-5x-1}}{2x+1}\right)\right)$  44)  $\left(\left(\frac{\text{frac}{9x^3-9x^2+18x+5}}{3x-1}\right)\right)$  45)  $\left(\left(\frac{\text{frac}{3x^3-2x^2+x-4}}{x+3}\right)\right)$  46)  $\left(\left(\frac{\text{frac}{-6x^3+3x^2-4}}{2x-3}\right)\right)$  47)  $\left(\left(\frac{\text{frac}{2x^3+7x^2-13x-3}}{2x-3}\right)\right)$  48)  $\left(\left(\frac{\text{frac}{3x^3-5x^2+2x+3}}{x+2}\right)\right)$  49)  $\left(\left(\frac{\text{frac}{4x^3-5x^2+13}}{x+4}\right)\right)$  50)  $\left(\left(\frac{\text{frac}{x^3-3x^2+x+2}}{x+2}\right)\right)$  51)  $\left(\left(\frac{\text{frac}{x^3-21x^2+14x-343}}{x-7}\right)\right)$  52)  $\left(\left(\frac{\text{frac}{x^3-15x^2+75x-125}}{x-5}\right)\right)$  53)  $\left(\left(\frac{\text{frac}{9x^3-x+2}}{3x-1}\right)\right)$  54)  $\left(\left(\frac{\text{frac}{6x^3-x^2+5x+2}}{3x+1}\right)\right)$  55)  $\left(\left(\frac{\text{frac}{x^4+x^3-3x^2-2x+1}}{x-1}\right)\right)$  56)  $\left(\left(\frac{\text{frac}{x^4-3x^2+1}}{x-1}\right)\right)$  57)  $\left(\left(\frac{\text{frac}{x^4+2x^3-3x^2+2x+6}}{x-3}\right)\right)$  58)  $\left(\left(\frac{\text{frac}{x^4-10x^3+7x^2-60x+36}}{x-2}\right)\right)$  59)  $\left(\left(\frac{\text{frac}{x^4-8x^3+24x^2-32x+16}}{x-2}\right)\right)$  60)  $\left(\left(\frac{\text{frac}{x^4+5x^3-3x^2-13x+10}}{x+5}\right)\right)$  61)  $\left(\left(\frac{\text{frac}{x^4-12x^3+54x^2-108x+81}}{x-3}\right)\right)$  62)  $\left(\left(\frac{\text{frac}{4x^4-2x^3-4x+2}}{2x-1}\right)\right)$  63)  $\left(\left(\frac{\text{frac}{4x^4+2x^3-4x^2+2x+2}}{2x+1}\right)\right)$  Answers to odd exercises: 35.  $\left(\left(4x^2+8x+16+\frac{\text{frac}{-1}}{x-2}\right)\right)$ .  $\left(\left(\text{mathrm}{\text{Quotient: }4x^2+8x+16, \text{ remainder: }-1}\right)\right)$  37.  $\left(\left(3x^2+3x+5\right)\right)$ .  $\left(\left(\text{mathrm}{\text{Quotient: }3x^2+3x+5, \text{ remainder: }0}\right)\right)$  39.  $\left(\left(x^3-2x^2+4x-8+\frac{\text{frac}{-6}}{x+2}\right)\right)$ .  $\left(\left(\text{mathrm}{\text{Quotient: }x^3-2x^2+4x-8, \text{ remainder: }-6}\right)\right)$  41.  $\left(\left(2x^2+2x+1+\frac{\text{frac}{10}}{x-4}\right)\right)$  43.  $\left(\left(2x^2-7x+1-\frac{\text{frac}{2}}{2x+1}\right)\right)$  45.  $\left(\left(3x^2-11x+34-\frac{\text{frac}{106}}{x+3}\right)\right)$  47.  $\left(\left(x^2+5x+1\right)\right)$  49.  $\left(\left(4x^2-21x+84-\frac{\text{frac}{323}}{x+4}\right)\right)$  51.  $\left(\left(x^2-14x+49\right)\right)$  53.  $\left(\left(3x^2+x+\frac{\text{frac}{2}}{3x-1}\right)\right)$  55.  $\left(\left(x^3-3x+1\right)\right)$  57.  $\left(\left(x^3-x^2+2\right)\right)$  59.  $\left(\left(4x^3-3x^2-8x+4\right)\right)$  65)  $\left(\left(x-2\right)\right)$ .  $\left(\left(3x^4-6x^3-5x+10\right)\right)$  66)  $\left(\left(x+3\right)\right)$ .  $\left(\left(-4x^3+5x^2+8\right)\right)$  67)  $\left(\left(x-2\right)\right)$ .  $\left(\left(4x^4-15x^2-4\right)\right)$  68)  $\left(\left(x-\frac{\text{frac}{1}}{x}\right)\right)$  69)  $\left(\left(x+\frac{\text{frac}{1}}{x}\right)\right)$  70)  $\left(\left(3x^4-x^3+2x-1\right)\right)$   $\left(\left(\text{bigstar}\right)\right)$  In the exercises below, use synthetic division to perform the indicated division. Write the polynomial in the form  $\left(\left(p(x)=d(x)q(x)+r(x)\right)\right)$ . 70.  $\left(\left(\frac{\text{frac}{3x^2-2x+1}}{x-1}\right)\right)$   $\left(\left(\text{div}\left(\frac{\text{frac}{x-1}}{x-1}\right)\right)\right)$  71.  $\left(\left(\frac{\text{frac}{x^2-5}}{x-2}\right)\right)$   $\left(\left(\text{div}\left(\frac{\text{frac}{x-5}}{x-2}\right)\right)\right)$  72.  $\left(\left(\frac{\text{frac}{3-4x-2x^2}}{x-2}\right)\right)$   $\left(\left(\text{div}\left(\frac{\text{frac}{x+1}}{x-2}\right)\right)\right)$  73.  $\left(\left(\frac{\text{frac}{4x^2-5x+3}}{x-2}\right)\right)$   $\left(\left(\text{div}\left(\frac{\text{frac}{x+3}}{x-2}\right)\right)\right)$  74.  $\left(\left(\frac{\text{frac}{x^3+8}}{x-3}\right)\right)$   $\left(\left(\text{div}\left(\frac{\text{frac}{x+2}}{x-3}\right)\right)\right)$  75.  $\left(\left(\frac{\text{frac}{4x^3+2x-3}}{x-3}\right)\right)$   $\left(\left(\text{div}\left(\frac{\text{frac}{x-3}}{x-3}\right)\right)\right)$  76.  $\left(\left(\frac{\text{frac}{18x^2-15x-25}}{x-5}\right)\right)$   $\left(\left(\text{div}\left(\frac{\text{frac}{x-5}}{x-5}\right)\right)\right)$  77.  $\left(\left(\frac{\text{frac}{4x^2-1}}{x-1}\right)\right)$   $\left(\left(\text{div}\left(\frac{\text{frac}{x-1}}{x-1}\right)\right)\right)$  78.  $\left(\left(\frac{\text{frac}{2x^3-3x^2+2x+1}}{x-1}\right)\right)$   $\left(\left(\text{div}\left(\frac{\text{frac}{x+1}}{x-1}\right)\right)\right)$  79.  $\left(\left(\frac{\text{frac}{3x^3-x+4}}{x-1}\right)\right)$   $\left(\left(\text{div}\left(\frac{\text{frac}{x-3}}{x-1}\right)\right)\right)$  80.  $\left(\left(\frac{\text{frac}{2x^3-3x+1}}{x-1}\right)\right)$   $\left(\left(\text{div}\left(\frac{\text{frac}{x-1}}{x-1}\right)\right)\right)$  81.  $\left(\left(\frac{\text{frac}{4x^4-12x^3+13x^2-12x+9}}{x-1}\right)\right)$   $\left(\left(\text{div}\left(\frac{\text{frac}{x-1}}{x-1}\right)\right)\right)$  82.  $\left(\left(\frac{\text{frac}{x^4-6x^2+9}}{x-3}\right)\right)$   $\left(\left(\text{div}\left(\frac{\text{frac}{x-3}}{x-3}\right)\right)\right)$  83.  $\left(\left(\frac{\text{frac}{x^6-6x^4+12x^2-8}}{x-2}\right)\right)$   $\left(\left(\text{div}\left(\frac{\text{frac}{x+3}}{x-2}\right)\right)\right)$  84.  $\left(\left(\frac{\text{frac}{x^4-12x^2+9}}{x-3}\right)\right)$   $\left(\left(\text{div}\left(\frac{\text{frac}{x-3}}{x-3}\right)\right)\right)$  85.  $\left(\left(\frac{\text{frac}{x^4-2x^3-5x+20}}{x+5}\right)\right)$  86.  $\left(\left(\frac{\text{frac}{x^4-2x^3-5x+20}}{x+5}\right)\right)$  87.  $\left(\left(\frac{\text{frac}{x^4-2x^3-5x+20}}{x+5}\right)\right)$  88.  $\left(\left(\frac{\text{frac}{x^4-2x^3-5x+20}}{x+5}\right)\right)$  89.  $\left(\left(\frac{\text{frac}{x^4-2x^3-5x+20}}{x+5}\right)\right)$  90.  $\left(\left(\frac{\text{frac}{x^4-9x^2+14}}{x-2}\right)\right)$  91)  $\left(\left(\frac{\text{frac}{3x^3-2x^2+x-4}}{x+3}\right)\right)$  92)  $\left(\left(\frac{\text{frac}{x^4+5x^3-4x-17}}{x+1}\right)\right)$  93)  $\left(\left(\frac{\text{frac}{-3x^2+6x+24}}{x-4}\right)\right)$  94)  $\left(\left(\frac{\text{frac}{5x^5-4x^4+3x^3-2x^2+x-1}}{x+6}\right)\right)$  95)  $\left(\left(\frac{\text{frac}{x^4-1}}{x-4}\right)\right)$  96)  $\left(\left(\frac{\text{frac}{3x^3+4x^2-8x+2}}{x-3}\right)\right)$  97)  $\left(\left(\frac{\text{frac}{4x^3+5x^2-2x+7}}{x+2}\right)\right)$  Answers to odd exercises: 85.  $\left(\left(1+\frac{\text{frac}{1}}{x-1}\right)\right)$  87.  $\left(\left(1+\frac{\text{frac}{1-i}}{x+1}\right)\right)$  89.  $\left(\left(x^2+ix-1+\frac{\text{frac}{1-i}}{x-1}\right)\right)$  91.  $\left(\left(-106\right)\right)$  93.  $\left(\left(0\right)\right)$  94.  $\left(\left(0\right)\right)$  95.  $\left(\left(255\right)\right)$  96.  $\left(\left(255\right)\right)$  97.  $\left(\left(-1\right)\right)$  98.  $\left(\left(-1\right)\right)$  G: Construct a polynomial from a graph and a given Factor Exercise  $\left(\frac{\text{PageIndex}{G}}{\right)}$   $\left(\left(\text{bigstar}\right)\right)$  Use the graph of the third-degree polynomial and one factor to write the factored form of the polynomial suggested by the graph. The leading coefficient is one. 98) Factor is  $\left(\left(x^2-x+3\right)\right)$  99) Factor is  $\left(\left(x^2+2x+4\right)\right)$  100) Factor is  $\left(\left(x^2+2x+5\right)\right)$  101) Factor is  $\left(\left(x^2+2x+2\right)\right)$  102) Factor is  $\left(\left(x^2+2x+1\right)\right)$  Answers to odd exercises: 99.  $\left(\left(x-1\right)\left(x^2+2x+4\right)\right)$  101.  $\left(\left(x+3\right)\left(x^2+2x+2\right)\right)$  Show Mobile Notice Show All Notes Hide All Notes Mobile Notice You appear to be on a device with a "narrow" screen width (i.e. you are probably on a mobile phone). Due to the nature of the mathematics on this site it is best views in landscape mode. If your device is not in landscape mode many of the equations will run off the side of your device (should be able to scroll to see them) and some of the menu items will be cut off due to the narrow screen width. For problems 1 - 3 use long division to perform the indicated division. Divide  $\left(\left(\frac{\text{frac}{3x^4-5x^2+3}}{x+2}\right)\right)$  by  $\left(\left(x+2\right)\right)$  Solution Divide  $\left(\left(\frac{\text{frac}{x^3+2x^2-3x+4}}{x-7}\right)\right)$  by  $\left(\left(x-7\right)\right)$  Solution Divide  $\left(\left(\frac{\text{frac}{2x^5+x^4-6x+9}}{x^2-3x+1}\right)\right)$  Solution For problems 4 - 6 use synthetic division to perform the indicated division. Divide  $\left(\left(\frac{\text{frac}{x^3+x^2+x+1}}{x+9}\right)\right)$  Solution Divide  $\left(\left(\frac{\text{frac}{7x^3-11}}{x+2}\right)\right)$  Solution Divide  $\left(\left(\frac{\text{frac}{5x^4+x^2-8x+2}}{x-4}\right)\right)$  Solution

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