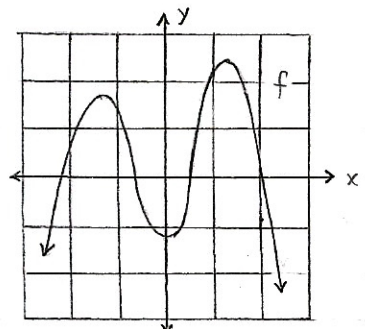


Section 4.1

- (46) Classify the polynomial $f(x) = 1 - 3x^2 - 5x^4$ as constant, linear, quadratic, cubic or quartic and determine the leading term, leading coefficient and degree.

- (47) Use the graph of f to identify the type and estimate the values of the extrema.



- (48) Determine if $f(x) = x^5 - 13x^3 + 36x$ is even, odd or neither. Justify your answer.

- (49) Prove symbolically that $f(x) = \sqrt{1-x^2}$ is even.

- (50) Complete the table assuming f is an odd function.

x	-6	-4	-2	0	2	4	6
$f(x)$	0	10			-8		

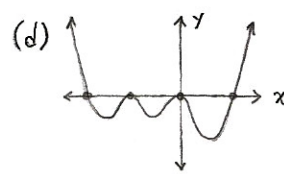
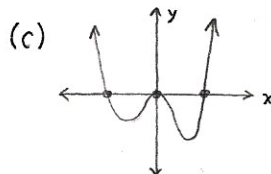
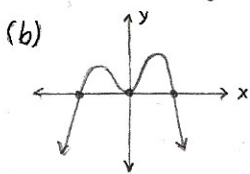
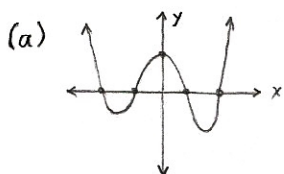
Section 4.2

- (51) Describe the end behavior (graphically and symbolically) of Exercise 46. Justify your answer.

- (52) In Exercise 47, (a) approximate the coordinates of the turning points, (b) estimate the x -intercepts and (c) state the minimum degree of f .

- (53) Assuming the table in Exercise 50 reflects a data sampling, (a) make a line graph of the data, (b) state the minimum degree of f , (c) decide if $a > 0$ or $a < 0$ and (d) find a formula for f .

- (54) Use turning points, the leading-term test and/or x -intercepts to match $f(x) = 2x^4 - 6x^2 - x$ with its graph (a-d). Justify your answer.



Section 4.2 (cont'd)

- 55) The following table lists the age equivalents for dogs and humans.

Age of Dog (in years)	x	0.25	0.5	1	2	4	6	8	10	14	18	21
Human Age (in years)	$h(x)$	5	10	15	24	32	40	48	56	72	91	106

- (a) Use your calculator to find a linear, quadratic or cubic function that best models the data. Write down and justify your answer.
- (b) Use your model to estimate the equivalent human age for a dog that is 2 years old.

Section 4.3

- 56) Divide by long and synthetic division: $\frac{3x^3 + 8x^2 - 2x + 1}{x + 3}$.
- 57) Divide: $\frac{x^3 - 2x^2 + 2x - 5}{x^2 + 1}$.
- 58) Determine the maximum number of (a) real zeros, (b) x -intercepts and (c) relative extrema (turning points) of the function $f(x) = ax^{10} + bx^5 + cx^2 + d$.
- 59) Form $P(x) = d(x)Q(x) + R(x)$ using Exercise 57.
- 60) Use the Remainder Theorem to show $f(7) = 188$ if $f(x) = 2x^3 - 11x^2 + 8x - 15$.

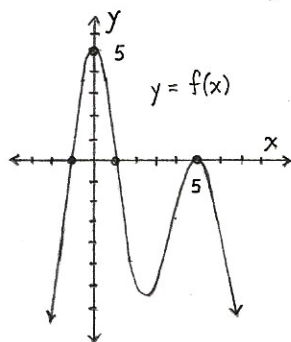
Section 4.4

- 61) Use synthetic division to prove $x - 5$ is a factor of $f(x) = 2x^3 - 11x^2 + 8x - 15$.
- In Exercises 62-63, write the complete factored form of f .
- 62) $f(x) = -3x^4 + x^3 + 21x^2 + 11x - 6$, given that $-2, -1, \frac{1}{3}$ and 3 are zeros.
- 63) $f(x) = 4x^3 - 23x^2 + 26x + 8$, given that 2 is a zero.
- 64) Use the Rational Zero Test and synthetic division to find the complete factored form of $f(x) = x^3 + 10x^2 + 31x + 30$.
- 65) State the x -intercepts of f in Exercise 64.

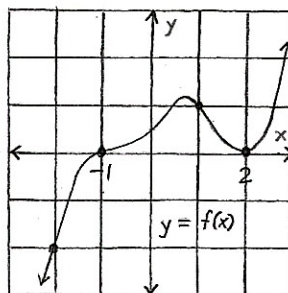
Section 4.4 (cont'd)

In Exercises 66-67, find the CFF of the polynomial (assume min degree).

(66)



(67)



- (68) State the multiplicity of the zeros of $f(x) = x^3(x-2)(x-5)^4$.
- (69) Determine where the graph of the polynomial in Exercise 68 crosses or is tangent to the x-axis.
- (70) Sketch the graph of the polynomial $f(x) = (x+2)(x-1)^2(x-3)$.

Section 4.5

- (71) Find the complete factored form of a cubic polynomial with real coefficients, a leading coefficient of -1 and zeros 5 , $3i$ and $-3i$.
- (72) Express your answer in Exercise 71 in expanded form.
- (73) Find the zeros of $f(x) = 2x^3 - 3x^2 + 50x - 75$ given $5i$ is a zero.
- (74) Write the complete factored form of Exercise 73.
- (75) Solve the polynomial equation $x^3 - 4x^2 + 6x - 4 = 0$.

Section 4.6

In Exercises 76-78, find the domain, asymptotes and holes of the rational function.

(76) $f(x) = \frac{3x-5}{2x+1}$

(77) $f(x) = \frac{x^2+4x-5}{x^2+8x+15}$

(78) $f(x) = \frac{x-5}{x^2-2x-3}$

(79) Solve: $\frac{3x+1}{x-2} = 0$

(80) Solve: $\frac{2x+3}{x-1} = 3$

In Exercises 81-83, sketch the graph of $y = f(x)$ using the 8-step procedure in this section (see notecard).

(81) $f(x) = \frac{x-1}{x-2}$

(82) $f(x) = \frac{x^2+x-2}{x^2-4}$

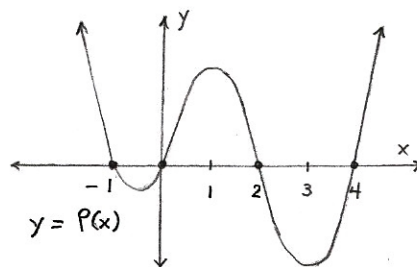
(83) $f(x) = \frac{x}{x^2-4}$

(84) Sketch the graph of Exercise 81 using transformations.
(Hint: $\frac{x-1}{x-2} = \frac{1}{x-2} + 1$.)

(85) Find the slant asymptote of $f(x) = \frac{4x^2-5x+1}{x-2}$.

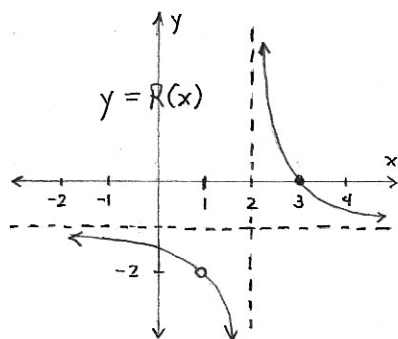
Section 4.7

(86) Solve the polynomial inequality $P(x) < 0$.

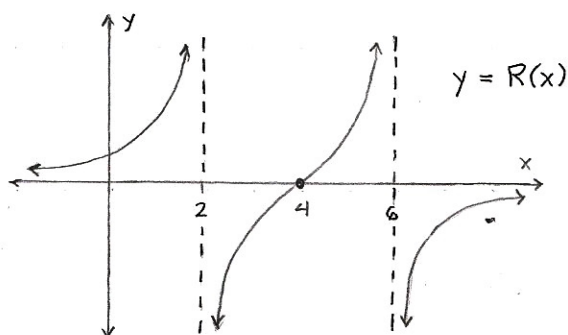


In Exercises 87-88, solve the rational inequality $R(x) < 0$.

(87)



(88)



(89) Solve $x^4 - 26x^2 + 25 \geq 0$ (a) symbolically and (b) graphically.

(90) Solve $\frac{2x-5}{x^2-1} \leq 0$ symbolically.

Section 4.8

⑨① Evaluate by hand.

(a) $125^{2/3}$ (b) $256^{-3/4}$ (c) $(-32)^{4/5}$

⑨② Convert to fractional exponents and simplify.

(a) $\sqrt[6]{x^5}$ (b) $\sqrt{x^3} \cdot \sqrt[3]{x}$ (c) $\sqrt{x \cdot \sqrt[4]{x}}$

⑨③ Solve the radical equation.

(a) $x^{3/2} = 125$ (b) $x^{-4/3} = 256$ (c) $(x-10)^{2/3} = 25$

⑨④ Solve: $4n^{-2} - 7n^{-1} - 2 = 0$.

⑨⑤ Solve: (a) $x^{4/3} - 13x^{2/3} + 36 = 0$

(b) $x^{4/5} - 3x^{3/5} - 10 = 0$. Round to 2 decimal places.