EXERCISE 5.17

1. Find $\lim_{x\to\infty} \frac{x}{x^2}$
2. Find $\lim_{x\to\infty} \frac{2}{x+4}$
3. Find $\lim_{x\to\infty} \frac{5x}{x^2+1}$
4. Find $\lim_{x\to\infty} \frac{2x^3}{x^3-x}$
5. Find $\lim_{x\to\infty} \frac{x^2}{x^2+7x+1}$
6. Find $\lim_{x\to\infty} \frac{6x^5}{x^5-2x-7}$
7. Find $\lim_{x\to\infty} \frac{2x^3-3x-6}{3x^3+1}$
8. Find $\lim_{x\to\infty} \frac{x^2}{4x^3+27x-9}$
9. Find $\lim_{x\to\infty} \frac{5x^2}{x+2}$
10. Find $\lim_{x\to\infty} \frac{3\sqrt{x}}{\sqrt{x}-1}$
11. (a) Show that
$$\frac{x^2+x+3}{x^2} = 1 + \frac{1}{x} + \frac{3}{x^2}$$
(b) Find $\lim_{x\to\infty} \frac{x^2+x+3}{x^2}$
(c) Find $\lim_{x\to-\infty} \frac{x^2+x+3}{x^2}$
12. Find
(a) $\lim_{x\to\infty} \frac{2x}{x+5}$
(b) $\lim_{x\to-\infty} \frac{2x}{x+5}$
13. Find
(a) $\lim_{x\to\infty} \frac{x^4}{3x^3+7x}$
(b) $\lim_{x\to\infty} \frac{5x^3}{4x+3}$

EXERCISE 5.18

Sketch

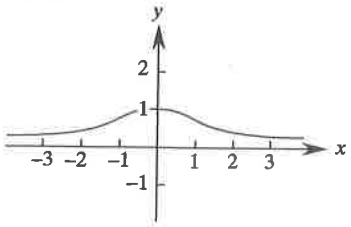
1. $y = \frac{1}{x^2+1}$
2. $y = \frac{1}{x^2-1}$
3. $y = \frac{x}{x+1}$
4. $y = \frac{x^2}{x^2+1}$
5. $y = \frac{x^2}{x^2-4}$
6. $y = 1 + \frac{x}{x^2+1}$
7. $y = \frac{x+2}{x^2-4}$
8. $y = \frac{4-x^2}{4+x^2}$
9. $y = x + \frac{1}{x}$
10. $y = \frac{3}{x^2-4}$

EXERCISE 5.17

1. 0 2. 0 3. 0 4. 2 5. 1 6. 6 7. $\frac{2}{3}$ 8. 0 9. $5x$ 10. 3
11. (b) 1 from above (c) 1 from below
12. (a) 2 from below (b) 2 from above
13. (a) $\frac{x}{3}$ (b) $\frac{5x^2}{4}$

EXERCISE 5.18

1.



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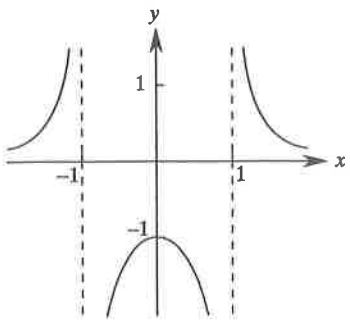

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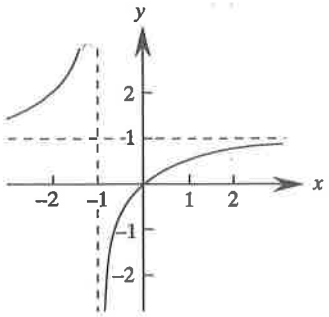

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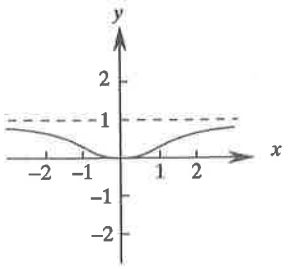

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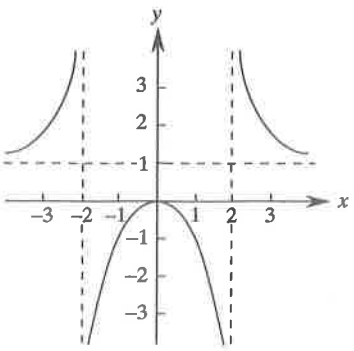

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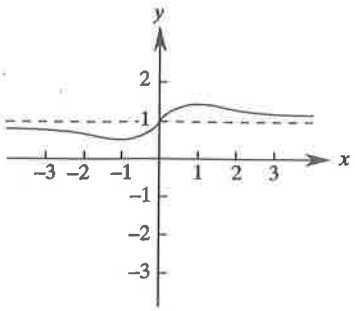

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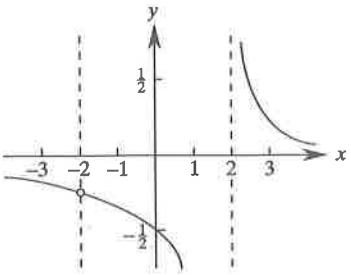

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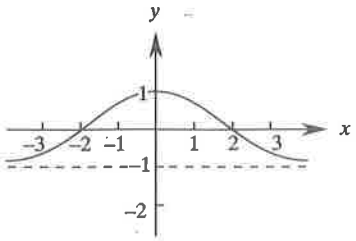

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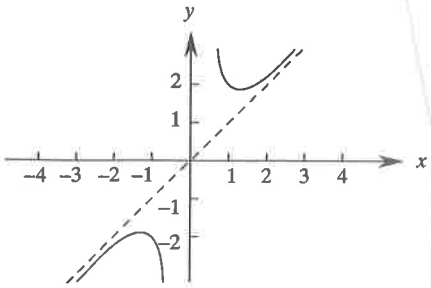

10.