

Test #2 will be given on Wednesday, 3/1. It will include material from Sections 2.5 – 2.9 and 3.1.

Suggested Review Exercises from your textbook:

<p>Chapter 2 Review (p. 175) Concept Check: 9 – 16 True-False: 9, 15, 16 Exercises: 1, 2, 6, 9, 12, 27, 29, 33, 35, 37, 39, 41, 43, 44a and b</p>	<p>Chapter 3 Review (p. 255) True-False: 1, 6, 12 Exercises: 3, 60, 63</p>
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Answers for even-numbered exercises:

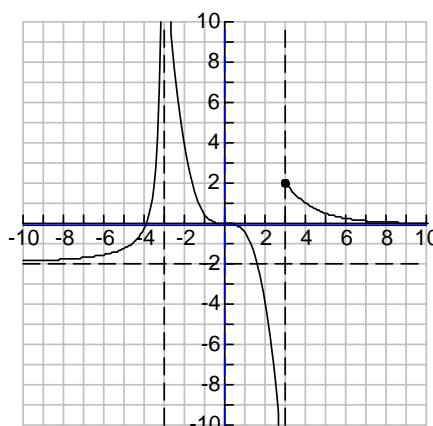
Chapter 2 Review:

True False: #16: True

Exercises: #2. (see graph on right) →

#6. $-\infty$ #12. $\frac{1}{3}$

**#44 (a) $F(1950) \approx 0.11,$
 $F'(1965) \approx -0.16,$
 $F'(1987) \approx 0.02$**



(b) The average number of children born to each woman was increasing at a rate of 0.11 children per year in 1950, decreasing by 0.16 children per year in 1965, and increasing by 0.02 children per year in 1987.

Chapter 3 Review:

True/False: #6 False #12 False

Exercises: #60 (a) $y = \frac{1}{4}x + \frac{1}{4}(\ln 4 + 1)$ (b) $y = ex$

Additional Review Exercises

1. Let $f(x) = \frac{2x^2 + 5x - 3}{7(x^2 - x - 12)}$.

(a) **Analytically** (without using your calculator) determine all vertical and horizontal asymptotes of $f(x)$. **VA: $x = 4$, HA: $y = \frac{2}{7}$**

(b) **Analytically** (without using your calculator) determine $\lim_{x \rightarrow -3} f(x)$. **Ans: $\frac{1}{7}$**

(c) At what value(s) of x is $f(x)$ discontinuous? **$x = 4$, $x = -3$**

2. Use your calculator to determine a numerical estimate for $f'(3)$ if $f(x) = 2^x$. Your answer should be correct to at least three decimal places. **Ans: 5.545**

3. Let $h(t)$ be a person's height (in inches) as a function of his or her age (in years).

(a) What are the units of $h'(t)$? **inches / year**

(b) Write a sentence explaining the meaning of the statement $h'(13) = 2$.

At age 13, the person is growing at a rate of 2 inches per year.

(c) Write a sentence explaining the meaning of the statement $h'(30) = 0$.

At age 30, the person's height is not changing.

4. Find the derivative of each function.

(a) $f(x) = 5x^3 - 3x^2 + 7x - 12$ $15x^2 - 6x + 7$	(b) $y = e^x + x^e + e^e$ $e^x + ex^{e-1}$	(c) $g(x) = \frac{x^4}{4} - \frac{2x^3}{3} + \frac{x^2}{2} + \frac{x}{5}$ $x^3 - 2x + x + \frac{1}{5}$
(d) $f(x) = \frac{4}{x^4} - \frac{3}{2x^3} + \frac{2}{x^2} + \frac{5}{x}$ $-\frac{16}{x^5} + \frac{9}{2x^4} - \frac{4}{x^3} - \frac{5}{x^2}$	(e) $y = x\sqrt{x} - 3\sqrt{x} + \sqrt[3]{x^2}$ $\frac{3}{2}x^{1/2} - \frac{3}{2x^{1/2}} + \frac{2}{3x^{1/3}}$	(f) $f(x) = \frac{x^4 - 5x^2 - 3}{x^2}$ $2x + \frac{6}{x^3}$

5. Write the equation of the tangent line to $y = 3e^x + 2x - 7$ when $x = 0$ on the curve.

$y = 5x - 4$

6. For what value or values of x does the function $y = \frac{1}{3}x^3 + 2x^2 - 12x + 7$ have a horizontal tangent line? **$x = -6, x = 2$**

7. Let $f(x) = \frac{1}{x}$

(a) Write the equation of the tangent line to $f(x)$ when $x = 1/3$ on the curve. Check your results graphically by graphing the function and the tangent line. **$y = -9x + 6$**

(b) For what value or values of x does the function $f(x) = \frac{1}{x}$ have a tangent line with slope of -4? **$x = \frac{1}{2}, x = -\frac{1}{2}$**