

Placement: Self Study Guide and Review for MAT 1475

Topic to review	Sample question for self test	Textbook	WeBWorK
		Review the topics and practice from the textbook: http://websupport1.citytech.cuny.edu/faculty/ttradler/Precalculus-Tradler-Carley.pdf	For further sample question for self test and practice, go to: https://mathww.citytech.cuny.edu/webwork2/Guest Access - MAT1375/ Click on: "Guest Login"
Functions (domain and range)	(a) Find the domain and range of the function $f(x) = x - 4$	Read chapter 3 and 5: Practice exercise (p. 45): 3.6 Practice exercises (p. 73-74): 5.1, 5.2	WeBWorK Set: "Functions - Notation"
Functions (evaluation)	(b) Evaluate and simplify the difference quotient $\frac{f(x+h)-f(x)}{h}$ for $f(x) = x^2 - 5x$	Read chapter 3: Practice exercises (p. 44-45): 3.1, 3.4, 3.5	WeBWorK Set: "Functions - Difference Quotient"
Functions (composition)	(c) Find the composition $(f \circ g)(x)$ for the functions $f(x) = x^2 + 3x$ and $g(x) = 2x + 7$	Read chapter 6.1: Practice exercises (p. 84): 6.4, 6.5	WeBWorK Set: "Functions - Operations"
Functions (inverse function)	(d) Find the inverse of the function $f(x) = \frac{2}{x+3}$	Read chapter 7: Practice exercise (p. 95-96): 7.2	WeBWorK Set: "Functions - Inverse Functions"

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Polynomial functions	(e) Find the roots of $f(x) = 2x^3 - 5x^2 + 2x$	Read chapters 9.1 and 9.2: Practice exercise (p. 129): 9.5 Practice exercise (p. 144): 10.3	WeBWorK Sets: "Polynomials - Graphs" "Polynomials - Theory"
Rational functions	(f) Graph the rational function, and identify its asymptotes, x-intercept(s), and y-intercept: $y = \frac{x-1}{x^2-4}$	Read chapter 11.1: Practice exercises (p. 168): 11.1-11.4	WeBWorK Sets: "Rational Functions - Domains" "Rational Functions - Intercepts" "Rational Functions - Asymptotes"
	(g) Solve the inequality: $\frac{x-3}{x+5} \geq 0$	Read chapter 12: Practice exercise (p. 180): 12.4	WeBWorK Set: "Rational Functions - Inequalities"

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Exponential and logarithmic functions	(h) Graph the function: $f(x) = 3^{-x}$	Read chapter 13: Practice exercises (p. 197-198): 13.2	WebWork Set: "Exponential Functions - Graphs"
	(i) Graph the function: $f(x) = \ln(x - 4)$	Read chapter 13: Practice exercises (p. 198): 13.6	WebWork Set: "Logarithmic Functions - Graphs"
Solving exponential equations	(j) Solve for x : $3e^{x-2} = 5$	Read chapter 14: Practice exercise (p. 207): 14.5	WebWork Set: "Exponential Functions - Equations"

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Trigonometric functions	(k) State the amplitude, period and phase shift of the following function: $f(x) = 5 \cdot \sin(2x - \pi)$ Graph the function.	Read chapter 17: Practice exercise (p. 251): 17.6	WebWork Sets: "Trigonometry - Graphing Amplitude" "Trigonometry - Graphing Period" "Trigonometry - Graphing Phase Shift" "Trigonometry - Graphing Comprehensive"
Solving sin, cos, tan equations	(l) Find all of the solutions between 0 and 2π of the following equation $2 \cdot \cos^2(x) + \sqrt{3} \cdot \cos(x) = 0$	Read chapter 20: Practice exercise (p. 283): 20.4	WebWork Set: "Trigonometry - Equations"

Selected answers:

- (a) domain $D = \mathbb{R}$, range $R = [-4, \infty)$, (b) $2x - 5 + h$, (c) $(f \circ g)(x) = 4x^2 + 34x + 70$, (d) $f(x) = \frac{2}{x} - 3$, (e) $x=0, x=2, x=\frac{1}{2}$,
(f) vertical asymptotes: $x = 2, x = -2$, horizontal asymptote: $y = 0$, x -intercept: $x = 1$, y -intercept: $y = \frac{1}{4}$,
(g) solution set $S = (-\infty, -5) \cup [3, \infty)$, (j) $x = 2 + \ln\left(\frac{5}{3}\right)$, (k) amplitude $A = 5$, period $P = \pi$, phase shift $S = \frac{\pi}{2}$, (l) $x = \frac{\pi}{2}, x = \frac{3\pi}{2}, x = \frac{5\pi}{6}, x = \frac{7\pi}{6}$