

Review sheet (MAT 123, Summer 2005)

1. No problems will be explicitly from Chapter 1. But be aware that some problems will use transformations of graphs (§1.6) and modeling with word problems (§1.9).
2. (§2.2) Transform a quadratic function into its standard form. Graph a quadratic function in its standard form. Understand that vertex means either maximum or minimum. Be able to do Related word problems, e.g. When is the product of two numbers with sum 40 the biggest and what is the biggest value?
3. (§2.3) Graph a general polynomial, e.g. $y = (x - 1)^2(x + 3)$.
4. (§2.6) Graph a general rational function, e.g. $y = \frac{x+1}{x^2-3x+2}$.
5. (§3.1) Graph an exponential function, e.g. $y = e^{x+1} - 2$.
6. (§3.2) Graph a logarithmic function, e.g. $y = \log_3(x - 3) + 1$.
7. (§3.2) Understand the meaning of logarithmic functions. Understand basic computations without a calculator, e.g. $\log_4 \frac{1}{2} = -\frac{1}{2}$, $\ln e^2 = 2$.
8. (§3.3) Know how to expand and condense log expressions using properties of logs, e.g. expand $\ln \frac{x^2}{(x-1)(x-2)}$ and condense $2 \log_2 y + 3 \log_2 z - \log_2 x$.
9. (§3.4) Know how to solve an exponential equation, e.g. $4^{2x} = 3^{x-1}$. Know how to solve a logarithmic equation, e.g. $\log_2(x - 1) + \log_2 x = 1$ (remember to check the answers).
10. (§3.5) Exponential growth and decay $A(t) = A_0 e^{kt}$, k the growth (or decaying if $k < 0$) rate. Understand half-life for decaying.
11. $335^\circ = ?$ radians, $-\frac{\pi}{6} = ?$ degrees.
12. A point on the unit circle in the second quadrant has x -coordinate $\frac{5}{13}$. What is the y -coordinate? What are the trigonometric function values of the angle formed by the line through the origin and this point with the x -axis?
13. An angle t in quadrant III has $\tan t = \frac{1}{2}$ (or $\sin t = -\frac{1}{3}$). What are the other trig values of t ?
14. Reference angle and use it to compute, e.g. $\sin 135^\circ$, $\tan \frac{5\pi}{4}$, $\cos(-\frac{3\pi}{4})$.
15. In a right triangle, if the tangent of an angle is $\frac{1}{2}$ and the adjacent side of the angle is 4 ft. How long are its opposite side and the hypotenuse?
16. What are the trig values of the angle formed by the line through point $(3, -4)$ and the origin with the x -axis?
17. Graph $y = 2 \sin(2x + \pi)$, $y = -\cos(4x - 2\pi)$. $y = 2 \tan(2x + \frac{\pi}{4})$.

18. Domains, ranges and graphs of inverse trig functions. Understand $\sin(\sin^{-1} x) = x$ and $\sin^{-1}(\sin x) = x$ when x is in suitable range.
19. Calculate $\cos(\sin^{-1} \frac{2}{3})$.