

Precalc Review

1. What is $1 + 2 \cdot 3$? What is $(1 + 2) \cdot 3$?
2. Why are $(-3)^2$ and -3^2 different? And what are their values?
3. Simplify $\left(\frac{2}{\sqrt{2}}\right)^{-4}$ and $\sqrt{200} - \sqrt{32}$.
4. Simplify $(3a^3b^3)(4ab^2)^2$.
5. Expand and simplify $(\sqrt{a} - \sqrt{b})(\sqrt{a} + \sqrt{b})$ and $(x + 2)^3$.
6. Factor $x^3y - 4xy$.
7. Simplify $\frac{x^2}{x^2-4} - \frac{x+1}{x+2}$.
8. Find all x such that $x^4 - 3x^2 + 2 = 0$.
9. Give examples which show that the following are just dreams:
 - (a) $(a + b)^2 = a^2 + b^2$
 - (b) $\sqrt{a + b} = \sqrt{a} + \sqrt{b}$
 - (c) $\sqrt{a^2 + b^2} = a + b$
 - (d) $\frac{1}{a+b} = \frac{1}{a} + \frac{1}{b}$(and find some values where the “rules” work).

10. Find an equation for the line with slope 2 which passes through $(2, 2)$.
11. Where does the line $x + y = 1$ intersect the circle $x^2 + y^2 = 2$?
12. Let $f(x) = x^3$. Evaluate $\frac{f(2+h)-f(2)}{h}$.
13. For $f(x) = 1 + (x - 1)^{-1}$, make a rough sketch of the graph of $y = f(x)$.
14. What is the domain of the function $f(x) = \frac{2x+1}{x^2+x-2}$? Of $g(x) = 2\sqrt{1+x}$?
15. What is the maximum value of the function $f(x) = 1 - 2x - x^2$? What about for $f(x) = \frac{2}{x^2-2x+3}$?
16. Which is bigger? 1000^{10} or 10^{1000} ? (Try using logarithms to prove it.)
17. Compute $\sin^2(72^\circ) + \cos^2(72^\circ)$.
18. Remember $\sin \theta$ and $\cos \theta$ when $\theta = 0, \pi/6, \pi/4, \pi/3, \pi/2$, and plot each $(\cos \theta, \sin \theta)$.
19. Remember the first few digits of $\sqrt{2}$, $1/\sqrt{2}$, and $\sqrt{3}/2$.

For more review, take a look at xxiv-xxviii in Stewart.