

This collection of questions is a form of self review. It is not important that you get every question correct, nor that you do questions you think are easy. Also some of the questions (particularly the later ones) are quite tricky. If you struggle with large portions of this however it is important to speak to your TA.

Geometry

1. Find the equation of the line which passes through $(3, -5)$ and has slope -2 .
2. Find the equation of the line which passes through $(2, 3)$ and $(4, 9)$.
3. Find the equation of the line parallel to $y = -2x + 1$ which goes through the point $(10, 10)$.
4. Find the equation of the line perpendicular to $y = \frac{x}{2} - 6$ which goes through the origin.
5. Find the equation of the circle which has as its center the midpoint between $(4, -1)$ and $(2, 5)$ and radius 9.

Roots, Radicals and Polynomials

6. Simplify the expression $\frac{6x}{\sqrt{x}} + \frac{2x^2}{x^{3/2}}$.
7. Solve the equation $3\sqrt{x} = x - 4$.
8. Solve the equation $x = 4\sqrt[3]{x}$.
9. Solve the equation $\sqrt{x+2} + \sqrt{x-2} = \sqrt{4x-2}$.
10. Find the maximum value of the function $f(x) = -x^2 - 5x + 9$.
11. Find a quadratic polynomial which has 5 and 1 as the x -intercepts and a minimum value of -12 .

Logarithms and Exponentials

12. Find all solutions of $x^{2/3} = 4$.
13. Re-write $2 \ln(3x - 4) - 5 \ln(2x - 7)$ as an expression involving a single logarithm.
14. Simplify $\frac{x^3(x^4)^5}{x^7(x^2)^4}$.

15. Simplify $\log_9(3) \log_5(1/25)$.

16. Simplify $\ln(\ln(e)) + \log_2(8)$.

Trigonometry

17. Find $\sin(11\pi/6)$, $\cos(4\pi/3)$ and $\tan(3\pi/4)$.

18. Find $\tan \theta$ if $\sin \theta = 24/25$ and θ is in the second quadrant.

19. Simplify $(\sin \theta + \cos \theta)^2$.

20. Simplify $\frac{1}{2}(\sin(a + b) + \sin(a - b))$.

21. Find all solutions to the equation $\sin \theta = \cos \theta$.

Inequalities

22. Solve the inequality $\frac{x}{2} - 1 < 3x + 9$.

23. Solve the inequality $|2x - 5| \leq 11$.

24. Solve the inequality $3\sqrt{x} - 1 < 5$.

25. Solve the inequality $|x^2 - 10| \leq 6$.