

Please show all your work and mark your answer clearly.

Evaluate the following numbers and write your answer **without** exponents.

1. 10^{-5}

2. $25^{\frac{1}{2}}$

3. $\frac{2^{\frac{3}{2}}}{2^{\frac{1}{2}}}$

4. $\left(\frac{8}{27}\right)^{-\frac{2}{3}}$

5. Use inequality notation and interval notation to express the set of negative numbers.

6. Simplify, using positive exponents only. $\frac{(2x)^{-1} x^3}{2x^{-2}}$

7. Give an example of a polynomial of degree four with leading coefficient -3 and constant term 5 .

8. Multiply: $(x - 1)^2(x + 1)$

9. Factor the difference of two cubes: $8x^3 - y^3$

10. Simplify the compound fraction: $\frac{\frac{1}{x} - \frac{1}{2}}{\frac{1}{2x}}$

11. Subtract and simplify: $\frac{2}{x-1} - \frac{1}{x+1}$

12. Find the midpoint of the line segment with endpoints (3 , -2) and (5 , 2)

13. Find the distance between the points (1 , 0) and (1 , 5)

14. Write in simplest radical form: $\sqrt{\frac{1}{2}}$

15. Write in simplest radical form: $\sqrt{12x^3}$

16. Rationalize the denominator and simplify: $\frac{2}{2 + \sqrt{3}}$

17. Write the equation for the circle with center (- 2,1) and radius 5.

18. Solve for x : $x^2 - 2x = 9$

19. Solve for x : $(x - 1)^2 = 8$

20. Solve for x : $4x - 3 = x^2$

21. Give an example of a quadratic equation with one real solution. (Hint: the discriminant must be zero.)

22. The inequality $|x - 1| < 3$ means the distance between _____ and _____ is _____. Therefore the answer will be _____ interval(s).

23. Solve the above inequality.

24. Without doing any more work, solve $|x - 1| > 3$

25. Let $x(x - 1) = 1$.

a) Can you conclude that $x = 1$ or $x - 1 = 1$? (Hint: substitute to see if it works)

b) What do you have to do to solve this problem?

c) Solve it, using the appropriate method.