

Math 139 Self-Assessment Test

Solve for all real answers & simplify:

1. $x^3 = 16x$
2. $x^2 - \frac{1}{3}x - \frac{3}{4} = 0$
3. $(x-1)(x+2)(x-3) = 6$
4. $2x + (27)^{-2/3} = 1$
5. $x^{22/3} = (16)^{11}$
6. $\sqrt{9} + \sqrt{3x+1} = x$

Given the function $f(x) = x^2 + 2x$, evaluate and simplify the following:

7. $f\left(-\frac{1}{3}\right)$
8. $2f(x^2) - f(2x)$
 $\frac{f(x+h) - f(x)}{h}$
9. h

For points A(4,-3) and B(-1,5)

10. Find the distance between these two points
11. Find the equation of the line between these two points

Answer the following questions:

12. Solve for x and rationalize your answer:

$$\sqrt{5} = \frac{2-x}{x}$$

13. Simplify completely: $\frac{\sqrt{16t^2 + 16}}{4t + 4}$

14. Evaluate: $4^{15}3^24^{-13}9^{-1}$

15. Simplify completely: $\sqrt{200x^7y^{18}}$

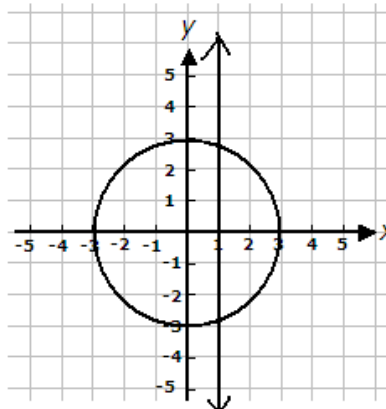
16. Solve for y: $\frac{1}{y} = \frac{1}{2} + \frac{2}{x}$

17. Evaluate: $\frac{\frac{2}{\frac{3}{5}}}{4} + 2^{-2}$

18. Simplify fully, using positive exponents: $\frac{x^2y^{-3}}{(4x^0y^4)^{-1/2}}$

19. In her monthly budget, Ivana has \$2,000 to spend between housing costs, bills, and personal expenses. She plans to have her housing costs amount to 40% of her spending. Also she expects to spend four times as much on bills as she spends on personal expenses. Given these constraints, how much should Ivana budget for bills?

20. In the following graph, a circle and a straight line are pictured. Find the exact coordinates where they intersect



21. Find the equation of a line parallel to $2x + 4y = 7$ going through the point $(4, -1)$
22. Find the value of the constant k so that the line $ky = 2x - 3$ is perpendicular to the line $x = 4y + 3$
23. Find the point or points on which the parabola $y = x^2 - 2$ intersects the line $x + y = 4$
24. Graph the two curves from #23, labeling the intersections points, any x-intercepts, and any y-intercepts.
25. A rectangle is four times as long as it is wide and its area is 9 square meters. Find the perimeter of this rectangle