

Read each question carefully. **Give exact, simplified answers.** You must show all work in order to receive full credit. **Circle your final answers for 11-20.**

Part I (2 points each)

Match the expression on the left with the property on the right. Write legibly; if I can't tell what letter you wrote, it will be marked wrong.

___ 1. $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

a. slope-intercept form of a line

___ 2. $(x - h)^2 + (y - k)^2 = r^2$

b. odd function

___ 3. $y - y_1 = m(x - x_1)$

c. quadratic function

___ 4. $f(-x) = f(x)$

d. midpoint between two points

___ 5. $\frac{f(x+h)-f(x)}{h}$

e. point-slope form of a line

___ 6. $f(a) = f(b)$ implies that $a = b$

f. standard equation of a circle

___ 7. $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

g. difference quotient

___ 8. $y = mx + b$

h. even function

___ 9. $f(x) = a(x - h)^2 + k$

i. distance between two points

___ 10. $f(-x) = -f(x)$

j. one-to-one function

Part II (8 points each)

11. Solve the inequality. Write the solution in set-builder notation.

$|3x + 5| \geq 10$

12. Find the radius of a circle whose center is $(-8,1)$ and passes through the point $(-2, -7)$.

13. Write the equation of the circle in standard form. $x^2 + y^2 - 4x - 10y + 20 = 0$

14. State the domain of the function in interval notation.

$$f(x) = \frac{\sqrt{x+2}}{x-3}$$

15. Determine the vertex of the parabola defined by the function $f(x) = -x^2 + 6x + 1$

16. $f(x) = 2x^2 + 5x - 3$

a. State the y-intercept(s) (if any).

b. State the x-intercept(s) (if any).

17. Write the slope-intercept equation for a line parallel to the line $x + y = 10$ that passes through the point $(2, -1)$.

18. For $f(x) = \frac{1}{x^2}$ and $g(x) = \sqrt{x-1}$.

a. Determine $(f \circ g)(x)$

b. Determine $(f - g)(2)$

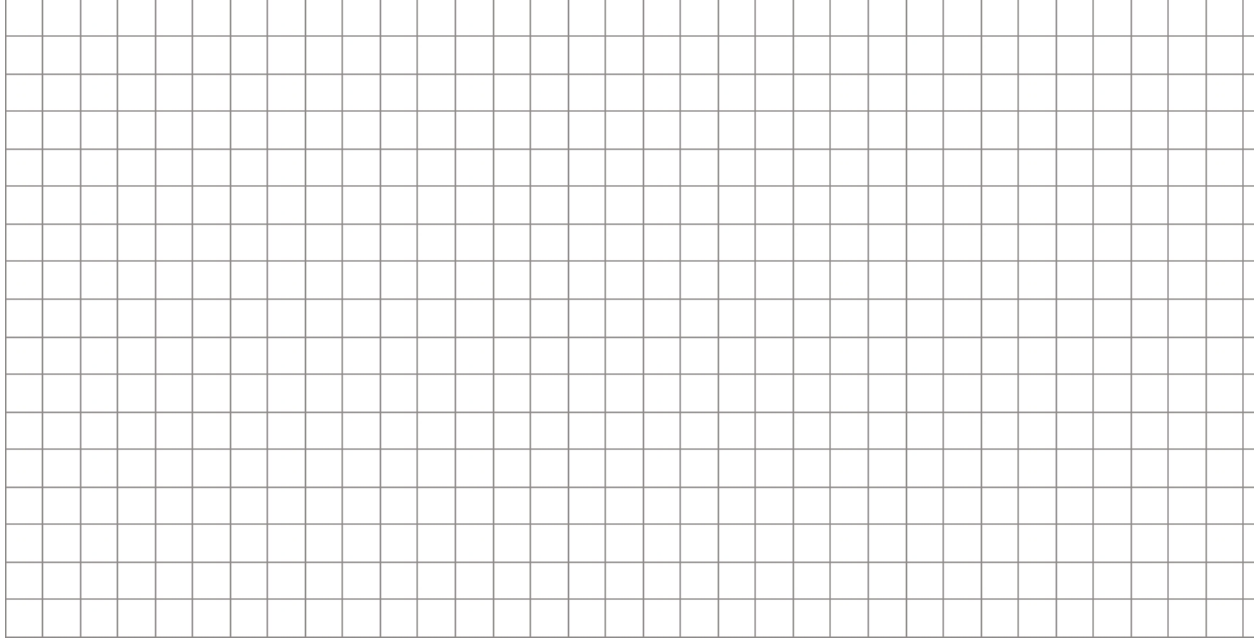
19. Determine whether the function $f(x) = x^5 - 3x$ is

a. even, odd, or neither

b. symmetric with respect to the x-axis, y-axis, origin, or none of these

20. Graph the function using transformations. Accurately label at least four reference points.

$$f(x) = -\frac{1}{2}(x - 4)^3 - 1$$



Bonus:

A. Evaluate the difference quotient. $f(x) = x^3 + x - 1$

B. Graph the function using translations. Clearly and accurately label all x- and y-intercepts, and at least two additional reference points. Graphs made by plotting points will not earn bonus points!

$$f(x) = -\frac{5}{2x-6} + 1$$

