Find the difference quotient.

1. Find \( \frac{f(x+h)-f(x)}{h} \) if \( f(x) = 5x^2 + 2x - 3 \)

2. Find the equation of a circle in standard form where \( F(-1,6) \) and \( D(-7,2) \) are endpoints of a diameter. Use the distance and midpoint formula.

Find the center and radius of the circle whose equation is:

3. \( 2x^2 + 2y^2 - 8x + 16y - 4 = 0 \)
4. \( x^2 + y^2 - 10x + 6y - 4 = 0 \)

5. Find the equation of the line that contains the point \((4,1)\) and is perpendicular to the equation \(3x + 4y = 10\)

6. Find the equation of the line that contains the points \((-3,5)\) and \((-1,-2)\)

7. Graph the function and state the domain and range.

\[
h(x) = \begin{cases} 
2x+1 & x \leq -2 \\
x^2 & -2 < x < 1 \\
3x-5 & 1 \leq x < 6 
\end{cases}
\]

8. Find the point on the y-axis which is 5 units from the point P(-2,4).

9. Find the standard equation of a parabola with a vertex at \((2, 4)\) and x-intercepts at \((0, 0)\) and \((4, 0)\).

10. Express \( f(x) = -4x^2 + 16x - 13 \) in the form \( f(x) = a(x-h)^2 + k \)

Given \( f(x) = 5x \) and \( g(x) = x^2 - 2 \), find the following. Simplify. State the domain of each. Domain \( f(x) = \underline{\underline{\text{Domain}}} \). Domain \( g(x) = \underline{\underline{\text{Domain}}} \)

11. \((f + g)(x)\)

12. \((\frac{f}{g})(x)\)
Given \( f(x) = \frac{4}{(x+7)(x-2)} \) and \( g(x) = \sqrt{x+2} \), find the following. Simplify. State the domain of each. Domain \( f(x) = \) \underline{__________}, Domain \( g(x) = \) \underline{__________}

13. \((f \cdot g)(x)\)

14. \((f - g)(x)\)

15. Given \( f(x) = \sqrt{x-5} \) and \( g(x) = 3x + 2x^2 \), find

\[ f(g(x)) = \] Domain of \( f(g(x)) = \)\n
16. Solve: \[
\begin{align*}
x^2 + y^2 &= 25 \\
3x + 4y &= -25
\end{align*}
\]

17. Solve \[
\begin{align*}
2x - 10y &= 4 \\
3x - 15y &= 6
\end{align*}
\]