

- (1) Give the interval notation for the set of numbers determined by the following conditions.
- (a) $3 \leq x \leq 7.5$
 - (b) $3 < x < \pi$
 - (c) $x \geq 3$
- (2) Find the straight lines satisfying each of the following conditions.
- (a) slope 5, through the point $(-11, 3)$.
 - (b) through the points $(1, 2)$ and $(4, 1)$.
- (3) Solve by completing the square
- (a) $x^2 + 4x + 2 = 0$
 - (b) $x^2 - 6x + 10 = 0$
- (4) Factor
- (a) $x^2 + 2x - 7$
 - (b) $x^2 - 2x + 3$
- (5) Find the limits if they exist.
- (a) $\lim_{x \rightarrow 2} \frac{x^2 + 2}{x - 2}$
 - (b) $\lim_{x \rightarrow 2} \frac{x^2 - 4}{x^2 - 4x + 4}$
 - (c) $\lim_{x \rightarrow 0} \frac{\sin x}{x}$
- (6) Find the derivative using the definition, i.e., by taking the appropriate limit.
- (a) $g(x) = x^3$

(b) $k(x) = \frac{1}{x}$.

(7) Find the tangent line at the indicated point.

(a) $y = 2x^2 - x - 1$ at $x = 2$

(b) $y = t2^t$ at $t = 0$

(8) Differentiate

(a) $f(x) = 2x + 3e^x$

(b) $w = \sqrt{1 - 5t}$

(c) $w = \sqrt{1 - 5t^2}$

(d) $h(t) = (x + 1)^{\frac{7}{3}}$.

(e) $f(x) = \frac{\sin x}{x^4 - 5x + 7}$

(f) $y = x^5 + 5^x$

(g) $w = 7e^t + e^{7t}$

(h) $h(t) = (t^2 + 5t + 1)^{10}$

(i) $f(x) = \ln(2e^x + \cos x)$

(j) $u(x) = x^2 \arctan x$