Show your work.

(1) Solve for $x$: $x + 5 = 3(x - 2)$

\[
x + 5 = 3x - 6
\]
\[
6 + 5 = 3x - x
\]
\[
11 = 2x \quad \Rightarrow \quad x = \frac{11}{2}
\]

(2) Solve for $x$: $ax - 3 = 2b$

\[
x = \frac{3 + 2b}{a}
\]

(a ≠ 0)

(3) Solve for $x$ by factoring: $4x^2 + 4x - 3 = 0$

\[
4x^2 + 4x - 3 = (2x - 1)(2x + 3)
\]

(4) Solve for $x$: $\frac{(2x+13)(3x-5)}{x+7} = 0$

\[
2x + 13 = 0 \quad \text{or} \quad 3x - 5 = 0
\]
\[
x = -\frac{13}{2} \quad \text{or} \quad x = \frac{5}{3}
\]

(5) Solve for $x$: $\frac{(2x-1)(x+5)}{\sqrt{3}-x} = 0$

\[
2x - 1 = 0 \quad \text{or} \quad x + 5 = 0
\]
\[
x = \frac{1}{2} \quad \text{or} \quad x = -5
\]
(6) Solve for $x$ by factoring out the common factor:
$$(x + 2)^4(2x - 3) - (x + 2)^4(x + 4) = 0$$
$$(x + 2)^4[(2x - 3) - (x + 4)] = 0$$
$$x + 2 = 0 \text{ or } 2x - 3 = x + 4$$
$$x = -2 \text{ or } x = 7$$

(7) Solve for $x$ by factoring out the common factor: $x^2(x - 7) + 2x^3(x + 3) = 0$
$$x^3[(x - 7)x + 2(x + 3)] = 0$$
$$x(x - 7) + 2x + 6 = 0$$
$$x^2 - 7x + 2x + 6 = 0$$
$$x^2 - 5x + 6 = 0$$
$$x = 3 \text{ or } 2$$

In problems (8), (9), and (10), solve the inequality, and write your answer in interval notation.

(8) $4 - 3x \leq 6$
$$4 - 6 \leq 3x$$
$$-2 \leq 3x$$
$$-\frac{2}{3} \leq x$$

(9) $3 < 2x + 1 \leq 5$
$$2 < 2x \leq 4$$
$$1 < x \leq 2$$

(10) $-4 > 3 - x > -9$
$$4 < x - 3 < 9$$
$$7 < x < 12$$