Problem 1: Write True or False for each statement.

(a) $x^3 \cdot 2x^2 = 2x^5$ (b) $(2^2 \cdot 3^2)^2 = 6^8$ (c) $\dfrac{1}{4^{-2}} = \dfrac{1}{16}$

Problem 2: Simplify the expression.

(a) $\sqrt{x^{-3}} \cdot \sqrt{25x^{-3}}$ (b) $\dfrac{(r^{2n})^4}{r^{5-2n}}$

Problem 3: Solve the equations using the quadratic formula.

(a) $3x^2 - 2x - 8 = 0$ (b) $x^2 + 4x + 2 = 0$

Problem 4: Find the real roots of the equations:

(a) $x^2 + 7x + 12 = 0$ (b) $x^3 - 3x = 0$

(c) $2t^3(3t - 1) + t^2(3t - 1)^2 = 0$ (d) $2x^{7/3} - x^{4/3} - x^{1/3} = 0$

Problem 5: Perform the indicated operations and simplify:

(a) $3 - 4x - [-x - (1 - x)]$

(b) $(a - 5b)^2$

Problem 6: Simplify the expressions:

(a) $\dfrac{x^2 + 2x - 3}{x^2 - 9}$

(b) $\dfrac{1 + \frac{1}{x}}{1 - \frac{1}{x}}$

(c) $\sqrt{\dfrac{2 + \sqrt{3}}{2 - \sqrt{3}}}$

(d) $\dfrac{3y}{\sqrt{2y}}$

Problem 7: Find an equation of the line that passes through the points $(2, -3)$ and $(3, 5)$.

Problem 8: What would the slope of a line perpendicular to the line in Example 7 be?