

BRONX COMMUNITY COLLEGE
of the City University of New York

DEPARTMENT OF MATHEMATICS & COMPUTER SCIENCE

MTH 28.5 Review Sheet II

1. Factor completely:

(a) $3b^2 + 12b$

(b) $12x^3y - 3y^3$

(c) $9x^2y^3 - 3x^2y^5$

(d) $25x^4 - 16y^2$

(e) $15ax + 9xy - 10ay - 6y^2$

(f) $x^2 - 3x - 10$

(g) $2x^2 - x - 6$

(h) $3x^2 - 2x + 5$

(i) $4x^2 - 12xy + 9y^2$

(j) $-3x^2 - xy + 10y^2$

(k) $2x^4 - 2x^3 - 12x^2$

2. Solve:

(a) $3x^2 = 27$

(b) $6x^2 = 3x$

(c) $x^2 - 8x + 16 = 0$

(d) $x^2 - 8x - 20 = 0$

(e) $2x^2 + x - 6 = 0$

(f) $x^2 + 2x = 15$

3. Determine the values for which the rational expression is undefined.

(a) $\frac{3x - 2}{4 - x}$

(b) $\frac{x^2 - 4}{6}$

(c) $\frac{x^2 - 3x + 2}{2x^2 - 7x + 6}$

4. Perform the indicated operations and simplify:

$$(a) \frac{6x^3 - 6x}{3x^3 + 3x^2}$$

$$(b) \frac{4yz}{5a^2} \cdot \frac{10a^5}{12xy} \div \frac{6}{3a}$$

$$(c) \frac{4x^2 + x - 5}{x^3 - x^2} \cdot \frac{x^2 + 2x}{4x^2 + 13x + 10}$$

$$(d) \frac{x^2 - 7x + 12}{x^2 - 4x + 4} \div (x - 3)$$

$$(e) \frac{2x^2 - 8y^2}{2xy - 4y^2} \div \frac{4x^2 - 16y^2}{2x^2 - 4xy}$$

$$(f) \frac{x^2 + x - 12}{x^2 - 9} \div \frac{x^2 + 4x}{x^2 + 5x + 6}$$

$$(g) \frac{2}{5x^2y} + \frac{1}{x} + 2$$

$$(h) \frac{2}{2x + 3} + \frac{1}{x + 5}$$

$$(i) \frac{2x^2 - 10}{2x^2 + 17x + 21} - \frac{x + 4}{x + 7}$$

$$(j) \frac{\frac{7}{ab} - \frac{3}{b^2}}{\frac{2}{a^2} + \frac{7}{b^2}}$$

$$(k) \frac{\frac{2}{x^2 - 4}}{\frac{5}{x + 2} - \frac{3}{x - 2}}$$

5. Solve:

$$(a) \frac{2}{x} + 7 = \frac{7x}{x + 5}$$

$$(b) \frac{3}{2x - 1} + \frac{1}{x} = 4$$

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

$$(d) \frac{2}{x + 2} + \frac{15}{x^2 - 4x - 12} = \frac{3}{x - 6}$$

The answers

$$1(a) \quad 3b(b + 4)$$

$$1(b) \quad 3y(4x^3 - y^2)$$

$$1(c) \quad 3x^2y^3(3 - y^2)$$

$$1(d) \quad (5x^2 + 4y)(5x^2 - 4y)$$

$$1(e) \quad (3x - 2y)(5a + 3y)$$

$$1(f) \quad (x - 5)(x + 2)$$

$$1(g) \quad (2x + 3)(x - 2)$$

$$1(h) \quad \text{Not factorable}$$

$$1(i) \quad (2x - 3y)^2$$

$$1(j) \quad (-3x + 5y)(x + 2y)$$

$$1(k) \quad 2x^2(x - 3)(x + 2)$$

$$2(a) \quad x = 3, x = -3$$

$$2(b) \quad x = 0, x = 1/2$$

$$2(c) \quad x = 4$$

$$2(d) \quad x = 10, x = -2$$

$$2(e) \quad x = -2, x = 3/2$$

$$2(f) \quad x = 3, x = -5$$

$$3(a) \quad x = 4$$

$$3(b) \quad \text{No values}$$

$$3(c) \quad x = 2, x = 3/2$$

$$4(a) \quad \frac{2x - 2}{\frac{x}{x - 4}}$$

$$4(b) \quad \frac{za^4}{\frac{3x}{x}}$$

$$4(c) \quad \frac{1}{\frac{x}{x + 2}}$$

$$4(d) \quad \frac{\frac{x}{x^2 - 4x + 4}}{2 + 5xy + 10x^2y}$$

$$4(e) \quad \frac{\frac{x}{2y}}{\frac{4x + 13}{2x^2 + 13x + 15}}$$

$$4(f) \quad \frac{\frac{x}{x}}{-11x - 22}$$

$$4(g) \quad \frac{\frac{5x^2y}{7ab - 3a^2}}{2b^2 + 7a^2}$$

$$4(h) \quad \frac{\frac{1}{x - 8}}{x - 8}$$

$$4(i) \quad \frac{-11x - 22}{2x^2 + 17x + 21}$$

$$4(j) \quad \frac{7ab - 3a^2}{2b^2 + 7a^2}$$

$$4(k) \quad \frac{1}{x - 8}$$

$$5(a) \quad x = -10/37$$

$$5(b) \quad x = 1, x = 1/8$$

$$5(c) \quad x = 2, x = -2$$

$$5(d) \quad x = -3$$

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