

BRONX COMMUNITY COLLEGE
of the City University of New York

DEPARTMENT OF MATHEMATICS & COMPUTER SCIENCE

MTH 28.5 Review Sheet I

1. Perform the indicated operations and simplify:

(a) $(-7) - (-4)$ (b) $(-7) + 14$ (c) $8 \div 0$ (d) $0 \div 2$ (e) $24 \div (-3)$

(f) $5(-7)$ (g) -2^4 (h) $(-2)^4$ (i) $\frac{-12}{-4}$ (j) $\left(\frac{2}{5}\right)\left(-\frac{1}{4}\right)$

(k) $2 - \frac{1}{5}$ (l) $\frac{1}{3} \div (-2)$ (m) $\left(-3\frac{5}{6}\right)\left(1\frac{3}{4}\right)$ (n) $-2\frac{3}{4} + 1\frac{2}{3}$

2. Perform the indicated operations and simplify:

(a) $(-7)(-6)(-3)$ (b) $2^3 - 3^2 + (3)(4)$ (c) $5 - 3 - [2 - (-3 + 5)]$ (d) $16 - 7 - 9 + 11$

(e) $5 \cdot 2^3 - 3$ (f) $3 - 2[1 - (2 - 9)]$ (g) $\frac{-3 + 5}{-5 + 4} - 3 + 6$ (h) $\frac{3}{4}(17 - 3 \cdot 3)$

3. Evaluate:

(a) $C = \frac{5}{9}(F - 32)$, if $F = 50$.

(b) $3a + bx - cy$, if $a = -2$, $b = 3$, $c = -4$, $x = 1$, $y = 0$.

(c) $5a + x^2 - by$, if $a = -2$, $b = 4$, $x = 16$, $y = -6$.

(d) $-x^2 - 2x - 5$, if $x = \frac{1}{2}$.

4. Solve:

(a) $11 + 3x = 26$

(b) $5x - 3 = 3x + 3$

(c) $x - 4 + 2x = 5x - 1 - 2x$

(d) $\frac{x+2}{5} - \frac{x+3}{4} = \frac{5}{2}$

(e) $3(2x - 1) - (7x + 1) = 3(3x - 4)$

5. Solve for the indicated variable:

(a) $C = \frac{5}{9}(F - 32)$, for F (b) $z = 5x - 7y$, for x (c) $3x - 2y = 7$, for y

6. Solve the inequality and graph the solution set :

(a) $2x + 1 \leq 4x - 3$ (b) $3x - 2 > x$ (c) $2x - (3x + 5) > 4x - 2(3x - 2)$

7. Sketch the graph of the linear equation:

(a) $3x + 2y = 6$ (b) $y = 2x - 3$ (c) $x = 3$

8. Function f is given by $f(x) = 7x - 8$. Find

(a) $f(3)$ (b) $f(a + 5)$ (c) $f(3t)$

9. Function f is given by $f(x) = 3x^2 - 5x + 3$. Find

(a) $f(1)$ (b) $f(3)$ (c) $f(-2)$

10. Perform the indicated operations :

(a) $(3x^2 - 2x + 3) + (-2x^2 + 3x - 7)$ (b) $2x^2 - 4x + 5 - (3x^2 - 11x + 6)$ (c) $(4a^2b^3)^2$

(d) $(3x^2y^5)(5xy^3 - 3x^2y^2 + 2x^3y^2)$ (e) $(x^2 - 3x + 2)(2x^2 - 3x + 7)$ (f) $\frac{20x^5y^7}{4x^2y^7}$

(g) $(3x^3 - 2x^2 + 4x - 6) \div (x - 5)$ (h) $\frac{24a^5b^4 + 16a^7b^3 - 8a^3b^2}{8a^3b^2}$ (i) $\frac{3ab^{-1} \cdot 5a^3b^2}{(3a^3b)^2}$

11. Simplify and write the answer in decimal form.

(a) 3.5×10^{-3} (b) $(2 \times 10^3)(6 \times 10^{-1})$ (c) $\frac{2 \times 10^3}{5 \times 10^6}$

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

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

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MTH 28.5 Review Sheet III

1. Simplify:

(a) $\sqrt{108}$

(b) $\sqrt{180}$

(c) $\sqrt[3]{40}$

(d) $\sqrt[3]{-64}$

2. Perform the indicated operations and simplify (all variables represent positive real numbers):

(a) $5\sqrt{12} - 4\sqrt{3} + \sqrt{75}$

(b) $(2\sqrt{3})(3\sqrt{5})$

(c) $(4 + \sqrt{2})(5 - 3\sqrt{2})$

(d) $(8 + 2\sqrt{3})^2$

(e) $(1 - 2\sqrt{11})(1 + 2\sqrt{11})$

(f) $\sqrt{\frac{7}{18}}$

(g) $\frac{\sqrt{2}}{\sqrt{5}}$

(h) $\frac{\sqrt{3}}{\sqrt{x}}$

(i) $\frac{\sqrt[3]{2x}}{\sqrt[3]{9x^2}}$

(j) $\frac{1}{2 + \sqrt{3}}$

(k) $\frac{\sqrt{x} - \sqrt{y}}{\sqrt{x} + \sqrt{y}}$

3. Perform the indicated operations and simplify (all variables represent positive real numbers):

(a) $64^{-2/3}$

(b) $\left(\frac{9}{16}\right)^{-1/2}$

(c) $(64x^3y \cdot xy^5)^{4/3}$

(d) $\left(\frac{27x^5y}{8y^3}\right)^{1/3}$

(e) $\left(\frac{8x^{1/4}y^{-3/4}}{x^{-1/2}y^3}\right)^{2/3}$

4. Solve the equation.

(a) $\sqrt{2x+3} - 3 = 0$

(b) $\sqrt{2x+5} = 3\sqrt{x-1}$

(c) $\sqrt{3x+4} - x = 2$

5. Perform the indicated operations of complex numbers and simplify:

(a) i^{173}

(b) $(2 - 3i)(5 - 7i) - (3 - 2i)$

(c) $\frac{4 - 7i}{5 + 3i}$

6. Solve the equation by completing the square.

(a) $x^2 + 6x - 12 = 0$

(b) $x^2 + 4x + 6 = 0$

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

7. Solve the equation by quadratic formula.

(a) $x^2 - 2x - 6 = 0$

(b) $x^2 - 3x = 0$

(c) $x^2 = 8$

8. Solve the equation by any method.

(a) $2x^2 + 18 = 0$

(b) $x^2 + 4x + 20 = 0$

(c) $4x^2 + 5x - 6 = 0$

(d) $(2x - 3)(x + 4) = 4$

(e) $x^4 - 7x^2 + 12 = 0$

9. Determine the exact value of:

(a) $\cos 60^\circ$

(b) $\csc 45^\circ$

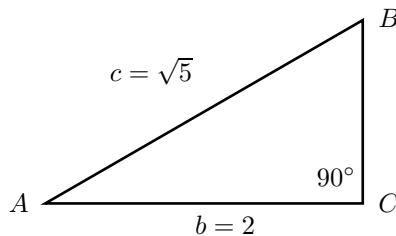
(c) $\sin 30^\circ - \cos 45^\circ$

10. Use the triangle to find:

(a) $\cos A$

(b) $\csc A$

(c) $\tan B$



11. Given that $\triangle ABC$ is a right triangle with $C = 90^\circ$, find the missing sides.

(a) $\cos A = \frac{1}{3}$, $b = 2$

(b) $\tan A = \frac{2}{3}$, $b = 6$

(c) $\cos B = \frac{1}{4}$, $c = 12$

12. The angle of elevation of the top of a tree is 60° from an observation point 80 feet from the base of the tree. Find the height of the tree.

13. Bill is standing on top of a 175 foot cliff overlooking a lake. The measure of the angle of depression to a boat is 30° .

(a) How far, exactly, is the boat from the foot of the cliff?

(b) How far is the boat from Bill?