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) $\dfrac{-12}{-4}$ (j) $\left(\dfrac{2}{5}\right)\left(-\dfrac{1}{4}\right)$

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

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) $\dfrac{-3+5}{-5+4}-3+6$ (h) $\dfrac{3}{4}(17-3\cdot 3)$

3. Evaluate:

(a) $C=\dfrac{5}{9}(F-32)$, 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 $x=\dfrac{1}{2}$.

4. Solve:

(a) $11+3x=26$ (b) $5x-3=3x+3$ (c) $x-4+2x=5x-1-2x$

(d) $\dfrac{x+2}{5}-\dfrac{x+3}{4}=\dfrac{5}{2}$ (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) $\left(4a^2b^3\right)^2$

(d) $\left(3x^2y^5\right)\left(5xy^3 - 3x^2y^2 + 2x^3y^2\right)$ (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) $\frac{2 \times 10^3}{5 \times 10^6}$

12. 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) $x^2 - x - 6$ (h) $x^2 - 4x - 5$ (i) $4x^2 - 12xy + 9y^2$

(j) $3x^2 + x - 10$ (k) $2x^4 - 2x^3 - 12x^2$

13. 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) $x^2 + 2x = 15$

14. Perform the indicated operations and simplify:

(a) $\dfrac{6x^3 - 6x}{3x^3 + 3x^2}$ (b) $\dfrac{4yz}{5a^2} \cdot \dfrac{10a^5}{12xy} \div \dfrac{6}{3a}$ (c) $\dfrac{4x^2 + x - 5}{x^3 - x^2} \cdot \dfrac{x^2 + 2x}{4x^2 + 13x + 10}$

(d) $\dfrac{x^2 - 7x + 12}{x^2 - 4x + 4} \div (x - 3)$ (e) $\dfrac{2x^2 - 8y^2}{2xy - 4y^2} \div \dfrac{4x^2 - 16y^2}{2x^2 - 4xy}$ (f) $\dfrac{x^2 + x - 12}{x^2 - 9} \div \dfrac{x^2 + 4x}{x^2 + 5x + 6}$

(g) $\dfrac{2}{5x^2y} + \dfrac{1}{x} + 2$ (h) $\dfrac{2}{2x + 3} + \dfrac{1}{x + 5}$ (i) $\dfrac{2x^2 - 10}{2x^2 + 17x + 21} - \dfrac{x + 4}{x + 7}$

(j) $\dfrac{\dfrac{7}{ab} - \dfrac{3}{b^2}}{\dfrac{2}{a^2} + \dfrac{7}{b^2}}$ (k) $\dfrac{\dfrac{2}{x^2 - 4}}{\dfrac{5}{x + 2} - \dfrac{3}{x - 2}}$

15. Solve:

(a) $\dfrac{2}{x}+7=\dfrac{7x}{x+5}$ (b) $\dfrac{3}{2x-1}+\dfrac{1}{x}=4$

(c) $\dfrac{x}{x-4}+\dfrac{1}{x+1}=\dfrac{2x}{x^2-3x-4}$ (d) $\dfrac{2}{x+2}+\dfrac{15}{x^2-4x-12}=\dfrac{3}{x-6}$

16. Simplify:

(a) $\sqrt{108}$ (b) $\sqrt{180}$ (c) $\sqrt[3]{40}$ (d) $\sqrt[3]{-64}$

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

(a) $5\sqrt{12}-4\sqrt{3}+\sqrt{75}$ (b) $\left(2\sqrt{3}\right)\left(3\sqrt{5}\right)$ (c) $(4+\sqrt{2})(5-3\sqrt{2})$

(d) $(8+2\sqrt{3})^2$ (e) $(1-2\sqrt{11})(1+2\sqrt{11})$ (f) $\sqrt{\dfrac{7}{18}}$

(g) $\dfrac{\sqrt{2}}{\sqrt{5}}$ (h) $\dfrac{\sqrt{3}}{\sqrt{x}}$ (i) $\dfrac{\sqrt[3]{2x}}{\sqrt[3]{9x^2}}$

(j) $\dfrac{1}{2+\sqrt{3}}$ (k) $\dfrac{\sqrt{x}-\sqrt{y}}{\sqrt{x}+\sqrt{y}}$

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

(a) $64^{-2/3}$ (b) $\left(\dfrac{9}{16}\right)^{-1/2}$ (c) $\left(64x^3y\cdot xy^5\right)^{4/3}$

(d) $\left(\dfrac{27x^5y}{8y^3}\right)^{1/3}$ (e) $\left(\dfrac{8x^{\frac{1}{4}}y^{-\frac{3}{4}}}{x^{-\frac{1}{2}}y^3}\right)^{2/3}$

19. Solve the equation.

(a) $\sqrt{2x+3}-3=0$ (b) $\sqrt{2x+5}=3\sqrt{x-1}$ (c) $\sqrt{3x+4}-x=2$

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

(a) i^{173} (b) $(2-3i)(5-7i)-(3-2i)$ (c) $\dfrac{4-7i}{5+3i}$

21. Solve the equation **by completing the square**.

(a) $x^2 + 6x - 12 = 0$ (b) $x^2 + 4x + 6 = 0$ (c) $2x^2 - 8x = 0$

22. Solve the equation **by quadratic formula**.

(a) $x^2 - 2x - 6 = 0$ (b) $x^2 - 3x = 0$ (c) $x^2 = 8$

23. Solve the equation **by any method**.

(a) $2x^2 + 18 = 0$ (b) $x^2 + 4x + 20 = 0$ (c) $4x^2 + 5x - 6 = 0$

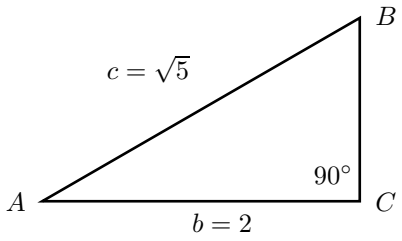
(d) $(2x - 3)(x + 4) = 4$ (e) $x^4 - 7x^2 + 12 = 0$

24. Determine the exact value of:

(a) $\cos 60^\circ$ (b) $\csc 45^\circ$ (c) $\sin 30^\circ - \cos 45^\circ$

25. Use the triangle to find:

(a) $\cos A$ (b) $\csc A$ (c) $\tan B$



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

27. 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.

28. 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?

6/2022 YH, IP