BRONX COMMUNITY COLLEGE
of the City University of New York

DEPARTMENT OF MATHEMATICS & COMPUTER SCIENCE

MTH 28 Review Sheet

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

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

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

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

3. 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) $2x^4 - 2x^3 - 12x^2$

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

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

(a) $\dfrac{3x-2}{4-x}$ (b) $\dfrac{x^2-4}{6}$ (c) $\dfrac{x^2-3x+2}{2x^2-7x+6}$

6. 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) $\dfrac{\dfrac{2}{x^2 - 4}}{\dfrac{5}{x + 2} - \dfrac{3}{x - 2}}$

7. 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) $\dfrac{2}{x + 2} + \dfrac{15}{x^2 - 4x - 12} = \dfrac{3}{x - 6}$

8. Simplify:

(a) $\sqrt{108}$

(b) $\sqrt{180}$

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

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

9. 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) $\dfrac{\sqrt{x} - \sqrt{y}}{\sqrt{x} + \sqrt{y}}$

10. 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) $\left(64x^3y \cdot xy^5\right)^{4/3}$

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

11. Solve the equation.

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

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

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

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

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

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

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

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

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

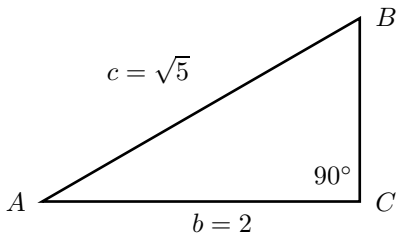
(d) $(2x-3)(x+4)=4$ (e) $x^4-7x^2+12=0$

16. Determine the exact value of:

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

17. Use the triangle to find:

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



18. Given that $\triangle ABC$ is a right triangle with $C = 90°$, find the missing sides.

(a) $\cos A = \frac{1}{3},\ b = 2$ (b) $\tan A = \frac{2}{3},\ b = 6$ (c) $\cos B = \frac{1}{4},\ c = 12$

19. 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.

20. 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?

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