BRONX COMMUNITY COLLEGE
of the City University of New York

DEPARTMENT OF MATHEMATICS & COMPUTER SCIENCE

MTH 28.5 Review Sheet III

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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) $\left(2\sqrt{3}\right)\left(3\sqrt{5}\right)$ (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) $\dfrac{\sqrt{x} - \sqrt{y}}{\sqrt{x} + \sqrt{y}}$

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

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) $\dfrac{4 - 7i}{5 + 3i}$

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

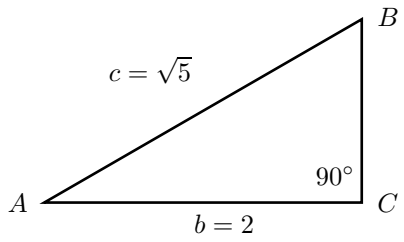
(d) $(2x - 3)(x + 4) = 4$ (e) $x^4 - 7x^2 + 12 = 0$

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?

The answers

1(a) $6\sqrt{3}$ **1(b)** $6\sqrt{5}$ **1(c)** $2\sqrt[3]{5}$ **1(d)** -4

2(a) $11\sqrt{3}$ **2(b)** $6\sqrt{15}$ **2(c)** $14-7\sqrt{2}$

2(d) $76+32\sqrt{3}$ **2(e)** -43 **2(f)** $\dfrac{\sqrt{14}}{6}$

2(g) $\dfrac{\sqrt{10}}{5}$ **2(h)** $\dfrac{\sqrt{3x}}{x}$ **2(i)** $\dfrac{\sqrt[3]{6x^2}}{3x}$

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

3(a) $\dfrac{1}{16}$ **3(b)** $\dfrac{4}{3}$ **3(c)** $256(x)^{16/3}y^8$

3(d) $3/2x^{5/3}y^{-2/3}$ **3(e)** $4x^{1/2}y^{-5/2}$

4(a) $x=3$ **4(b)** $x=2$ **4(c)** $x=0, x=-1$

5(a) i **5(b)** $-14-27i$ **5(c)** $\dfrac{-1}{34}-\dfrac{47i}{34}$

6(a) $x=-3+\sqrt{21}, x=-3-\sqrt{21}$ **6(b)** $x=-2+\sqrt{2}i, x=-2-\sqrt{2}i$ **6(c)** $x=0, x=4$

7(a) $x=1+\sqrt{7}, x=1-\sqrt{7}$ **7(b)** $x=0, x=3$ **7(c)** $x=2\sqrt{2}, x=-2\sqrt{2}$

8(a) $x=3i, x=-3i$ **8(b)** $x=-2+4i, x=-2-4i$ **8(c)** $x=-2, x=3/4$

8(d) $x=\dfrac{-5+\sqrt{153}}{4}, x=\dfrac{-5-\sqrt{153}}{4}$ **8(e)** $x=2, x=-2, x=\sqrt{3}, x=-\sqrt{3}$

9(a) $1/2$ **9(b)** $\sqrt{2}$ **9(c)** $\dfrac{1-\sqrt{2}}{2}$

10(a) $2\sqrt{5}/5$ **10(b)** $\sqrt{5}$ **10(c)** 2

11(a) $a=4\sqrt{2}, c=6$ **11(b)** $a=4, c=2\sqrt{13}$ **11(c)** $a=3, b=3\sqrt{15}$

12 $80\sqrt{3}$

13(a) $175\sqrt{3}$ **13(b)** 350

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