

Algebra 3 Review Worksheet

A. Solve for x and graph

1. $\left| \frac{1}{x-1} \right| = 2$

2. $\frac{x+2}{|x+2|} = -1$

3. $\left| \frac{3-7x}{2} \right| \leq 13$

4. $|2-3x|+5 > 9$

5. $|2x-1|-|x+2| \leq 2$

7. $\left| \frac{1}{x} + 4 \right| \geq 5$

B. Simplify

1. $(2x)^2(-3x^2)^3 - \frac{8(x^8+y^{10})^5}{4(x^8+y^{10})^4} - (4y)^3(2y)^7$

2. $2^x + 2^x + 2^{x+1} + 2^x + 2^{x+1} + 2^x$

4. $\frac{(-x^5y^{-2})^4(9x^4y^3)}{6x^{22}y^5}$

3. $-2(1+x^2)^{-3}(2x)$

5. $\left(\frac{1}{x^3y^{-1}} \right)^{-2}$

C. Evaluate

1. $\frac{9^{-1/2} \cdot 81^{1/4}}{27^{-2/3} \cdot 3^{-2}}$

2. $\left(\frac{16}{625} \right)^{3/4} + \left(\frac{243}{32} \right)^{1/5}$

3. $\left(\frac{-27a^6}{b^{-9}} \right)^{-2/3}$

4. $\sqrt[4]{\frac{x^{3n+7}y^n}{x^{3n+3}y^{5n}}}$

5. $\sqrt[4]{\sqrt{256}}$

D. Simplify

1. $\sqrt[3]{-24} + \sqrt[3]{81}$

2. $\sqrt[4]{512x^{27}y^{15}z^2}$

3. $\sqrt[3]{\frac{3x^{20}}{16y^9z^6}}$

4. $\sqrt[4]{x^2} \sqrt[5]{x} \sqrt[3]{x^2}$

E. Simplify

1. $(2x^3 - x^2)(6x - 5) + (3x^2 - 5x)(6x^2 - 2x)$

2. $-3x^2y^5(-8x^4y^5 + x^{-2}y^{-5} - 3^xxy)$

F. Rationalize the denominator and simplify

1. $\frac{x^{1/2} - 2}{x^{1/2} - 6}$

G. Solve for x

1. $|x-3| + |2x-4| + |x-6| = 6$

2. $|x-3| + |2x-4| + |x-6| = 5$

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Answers:

A.

1. $x = \frac{3}{2}$ and $\frac{1}{2}$

2. $x < -2$

3. $\frac{-23}{7} \leq x \leq \frac{29}{7}$

4. $x > 2$ or $x < -\frac{2}{3}$

5. $-1 \leq x \leq 5$

7. $-\frac{1}{9} \leq x \leq 1$ and $x \neq 0$

B.

1. $-110x^8 - 130y^{10}$

2. 2^{x+3}

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

4. $\frac{(3x^2)}{2y^{10}}$

5. $\frac{x^6}{y^2}$

C.

1. 81

2. $\frac{391}{250}$

3. $\frac{1}{9a^4b^6}$

4. $\frac{x}{y^n}$

5. 2

D.

1. $\sqrt[3]{3}$

2. $4x^6y^3\sqrt[4]{2x^3y^3z^2}$

3. $\frac{x^6\sqrt[3]{12x^2}}{4y^3z^2}$

4. $x^{\frac{7}{12}}$

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E.

1. $30x^4 - 52x^3 + 15x^2$
2. $24x^6y^{10} - 3 + 3^{x+1}x^3y^6$

F.

1. $\frac{x + 4\sqrt{x} - 12}{x - 36}$

G.

1. $x = 4\frac{3}{4}, 3\frac{1}{2}, 1\frac{3}{4}$
2. $2 \leq x \leq 3$ or $x = 4\frac{1}{2}$