

Algebra Review Worksheet

(1) Express each of the following as a single fraction in simplified form please.

(a) $\frac{6x - 6}{3 - 3x}$

(b) $\frac{x^5 - 2x^4 + 3x^3 - 6x^2}{x^4 - 8x}$

(2) Perform the indicated operations. Express each answer as a single fraction in simplified form.

(a) $\frac{1}{6x} + \frac{1}{3y} - \frac{3x + 2y}{12xy}$

(g) $\left(\frac{x+4}{2x-4} - \frac{2x+5}{x^2-x-2} + \frac{3}{4} \right) \div \left(\frac{5x+9}{x+1} \right)$

(b) $\frac{x^2 + 4x - 1}{2x - 3} - \frac{8 + x - x^2}{2x - 3}$

(h) $\left(x - \frac{2}{x+1} \right) \cdot \left(1 - \frac{1}{x+2} \right)$

(c) $\frac{5x + 1}{x^2 - 2x - 3} - \frac{1}{x + 1} - \frac{3}{3 - x}$

(i) $\frac{x - 4}{2x^2 + 3x - 2} + \frac{6}{x^2 - x - 6}$

(d) $\frac{x}{x-3} + \frac{x^2 + 9}{9 - x^2} + \frac{3}{x+3}$

(j) $\frac{\left(\frac{x+1}{x-1} - \frac{2}{x+1} \right)}{\left(\frac{x-1}{x+1} + \frac{2x}{x-1} \right)}$

(e) $\frac{(2x^3)^2}{3y^4} \cdot \frac{(-y^3)^2}{8x^4}$

(k) $\frac{\left(x + 2 - \frac{12}{x+3} \right)}{\left(x - 5 + \frac{16}{x+3} \right)}$

(f) $\frac{9 - x^2}{4x^3 + 3x^2 + 4x + 3} \div \frac{x^3 + 27}{24x^2 - 2x - 15} \div \frac{6x^2 - 23x + 15}{x^3 - 3x^2 + 9x}$

(3) Divide. Express each answer as a polynomial or a mixed expression please.

(a) $\frac{x^2 + 4x + 8}{x + 3}$

(b) $\frac{x^3 - 4x^2 + x + 6}{x - 2}$

(4) Factor the polynomial $12x^4 + 59x^3 - 97x^2 - 94x + 120$ if $x^2 + 5x - 6$ is a factor.

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Answers

(1) (a) -2

(b) $\frac{x(x^2 + 3)}{x^2 + 2x + 4}$

(2) (a) $\frac{1}{12y}$

(g) $\frac{1}{4}$

(b) $x + 3$

(h) $x - 1$

(c) $\frac{7}{x - 3}$

(i) $\frac{(x + 3)}{(2x - 1)(x - 3)}$

(d) $\frac{6}{x + 3}$

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

(e) $\frac{x^2 y^2}{6}$

(k) $\frac{x + 6}{x - 1}$

(f) $-\frac{x}{x^2 + 1}$

(3) (a) $x + 1 + \frac{5}{x + 3}$

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

(4) $(x - 1)(x + 6)(4x + 5)(3x - 4)$

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1.10 Algebra 3 Review Worksheet

Simplify each of the following please.

(1) $\sqrt{-81}$

(13) $4i^{-3} - 3i^{-13}$

(2) $(\sqrt{-15})(-\sqrt{10})$

(14) $(3 + 4i) + (5 - 2i)$

(3) $(-3\sqrt{5})(3\sqrt{-5})$

(15) $(3 + 4i) - (5 - 2i)$

(4) $(-\sqrt{-9})(\sqrt{-25})$

(16) $(3 + 4i)(5 - 2i)$

(5) $(4\sqrt{-12})(-2\sqrt{-3})$

(17) $(2 + 7i) - (3 + 4i) + (7 - 6i)$

(6) $\sqrt{-\frac{14}{21}}$

(18) $(4 + 3i)^2$

(7) $(4i)^2 - 16$

(19) $(2 - \sqrt{5}i)^2 - 4(2 - \sqrt{5}i) + 9$

(8) $(-i)^3 (i^2)^3$

(20) $(2 + 3i)^3$

(9) i^{123}

(21) $(1 + i)^{-3}$

(10) i^{-57}

(22) $\frac{4 + 3i}{5 - 2i}$

(11) $i^2 + i^4$

(23) $\frac{\sqrt{-6} - \sqrt{-2}}{\sqrt{-6} + \sqrt{-2}}$

(12) $i^3 + i^5 + i^7$

(24) $\frac{4 + i}{3 - i} - \frac{-1 + 2i}{1 + 3i}$

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Answers

(1) $9i$

(2) $-5\sqrt{6}i$

(3) $-45i$

(4) 15

(5) 48

(6) $\frac{\sqrt{6}i}{3}$

(7) -32

(8) $-i$

(9) $-i$

(10) $\frac{1}{i}$

(11) 0

(12) $-i$

(13) $7i$

(14) $8 + 2i$

(15) $-2 + 6i$

(16) $23 + 14i$

(17) $6 - 3i$

(18) $7 + 24i$

(19) 0

(20) $-46 + 9i$

(21) $\frac{-1 - i}{4}$

(22) $\frac{14 + 23i}{29}$

(23) $2 - \sqrt{3}$

(24) $\frac{3 + i}{5}$