

ALGEBRA SAMPLE TEST

Simplifying and Evaluating Expressions

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| 1. Simplify: $8x - 4(2x - 5) - 2$ | a) $6x + 18$ b) -22 c) $6x - 7$ d) 18 |
| 2. Simplify: $ 9 - 17 - 8 - 12 $ | a) -12 b) -4 c) 4 d) 1 |
| 3. Combine similar terms: $4x^3 - 3x^2 + 6x^3 + x^2$ | a) $10x^6 - 2x^4$ b) $8x^6$ c) $x + 7x^5$ d) $10x^3 - 2x^2$ |
| 4. Write as a power of 2: $(2^3)^2(2)^4$ | a) 2^{24} b) 2^9 c) 2^{10} d) 2^{13} |
| 5. Simplify: $(3x^3y)^2(xy^3)$ | a) $9x^7y^5$ b) $9x^6y^5$ c) $9x^6y^6$ d) $9x^7y^6$ |
| 6. Simplify: $\frac{6.9 \times 10^4}{2.3 \times 10^7}$ | a) 4.6×10^3 b) 3.0×10^3 c) 3.0×10^{-3} d) 4.6×10^{-3} |
| 7. Simplify: $\frac{x^{-2}y^{-3}}{x^5y^{-4}}$ | a) x^3y^{-7} b) $x^{-7}y^{-1}$ c) x^7y^7 d) $x^{-7}y$ |
| 8. Combine: $9a^2b - 5ab^2 + a^2b - 2ab^2$ | a) $a^2b - 4ab^2$ b) $4a^2b - ab^2$ c) $10a^2b - 7ab^2$ d) $10a^2b - 10ab^2$ |
| 9. Simplify: -4^{-1} | a) 4 b) $\frac{1}{4}$ c) -4 d) $-\frac{1}{4}$ |
| 10. Evaluate: $7 - (2x - y)^2$ for $x = -3, y = 4$ | a) 107 b) -93 c) 3 d) 11 |
| 11. If $f(x) = x^2 + 2x + 1$, find $f(-4)$ | a) -23 b) 9 c) 25 d) -15 |
| 12. If $g(x) = 4 - 5x$, find $g(a - 4)$. | a) $-a - 4$ b) $-5a - 16$ c) $-5a + 24$ d) $-a + 4$ |

Polynomials

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|---|--|
| 1. Multiply: $(5a + 6)(a - 1)$ | a) $5a^2 + 11a - 6$ b) $5a^2 + a - 6$ c) $5a^2 - a - 6$ d) $5a^2 + a + 6$ |
| 2. Multiply: $(3x^3 - 2y)^2$ | a) $9x^9 + 4y^2$ b) $9x^6 - 12x^3y + 4y^2$ c) $9x^9 - 12x^3y + 4y^2$ d) $9x^6 + 4y^2$ |
| 3. Subtract: $(4x^2y^2 - 2xy + 8y^2) - (-2x^2y^2 + 3xy - 8y^2)$ | a) $2x^2y^2 + xy$ b) $6x^2y^2 - 5xy + 16y^2$ c) $6x^2y^2 + 5xy$ d) $8x^4y^4 + 6x^2y^2 + 64y^2$ |
| 4. Factor completely: $16x^2 - 25$ | a) $(4x - 5)^2$ b) $(4x + 5)^2$ c) $(8x - 5)^2$ d) $(4x - 5)(4x + 5)$ |
| 5. Factor completely: $2x^3y - 30x^2y + 108xy$ | a) $2xy(x - 9)(x - 6)$ b) $2xy(x^2 - 15x + 54)$ c) $2xy(x + 9)(x + 6)$ d) $2(x^2 - 9y)(x - 6y)$ |

Linear Equations, Inequalities, Systems

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|--|---|
| 1. Solve for x: $8 - 2(3 - 2x) = 3(x - 1)$ | a) $\frac{7}{5}$ b) -3 c) $\frac{19}{15}$ d) -5 |
| 2. Solve for x: $2 - \frac{2x}{5} = \frac{x}{3} - 4$ | a) $\frac{90}{11}$ b) $\frac{90}{17}$ c) $-\frac{90}{17}$ d) $\frac{30}{7}$ |

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|---|-----------------------------|---------------------|---------------------------------|-----------------------|
| 3. Solve this inequality for x : $-2x + 6 \geq 4$ | a) $x \geq 1$ | b) $x \leq 1$ | c) $x \geq -5$ | d) $x \leq -5$ |
| 4. Find the y -value of the solution of $\begin{cases} 5x - y = 1 \\ -2x + 3y = 10 \end{cases}$ | a) -6 | b) -4 | c) 4 | d) 1 |
| 5. Solve for h : $V = \frac{1}{3}\pi r^2 h$ | a) $\frac{3V}{\pi r^2} = h$ | b) $3\pi r^2 V = h$ | c) $\frac{1}{3}V - \pi r^2 = h$ | d) $3V - \pi r^2 = h$ |

Rational Expressions and Equations

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|---|------------------------------|-----------------------------|---------------------------|-----------------------------|
| 1. Combine. Leave answer simplified: $\frac{6-x}{x^4} + \frac{2+7x}{x^4}$ | a) $\frac{2(4+3x)}{x^4}$ | b) $\frac{2(4+3x)}{x^8}$ | c) $\frac{2(4x+3)}{x^4}$ | d) $\frac{2+3x}{x^2}$ |
| 2. Simplify: $\frac{15x}{5x+5} \cdot \frac{x^2+3x+2}{x^2+2x}$ | a) $\frac{3(3x+2)}{5(2x)}$ | b) $\frac{3x(x+2)}{x^2+2x}$ | c) $\frac{3(x+2)}{5}$ | d) 3 |
| 3. Reduce, if possible: $\frac{x^2-2x-15}{x^2-25}$ | a) $\frac{x+3}{x-5}$ | b) $\frac{x+3}{x+5}$ | c) $\frac{3}{5}$ | d) Cannot reduce |
| 4. Simplify: $\frac{\frac{1}{x} + \frac{1}{x^2}}{\frac{1}{x}}$ | a) $\frac{1}{x^2}$ | b) 1 | c) 2 | d) $\frac{x+1}{x}$ |
| 5. Combine and simplify: $\frac{3}{x-1} - \frac{2}{x-3}$ | a) $\frac{x-11}{(x-1)(x-3)}$ | b) $\frac{1}{2}$ | c) $\frac{1}{(x-1)(x-3)}$ | d) $\frac{x-7}{(x-1)(x-3)}$ |
| 6. List restrictions for this function: $f(x) = \frac{x+5}{x-7}$ | a) $x \neq 5, x \neq 7$ | b) $x \neq -5, x \neq 7$ | c) $x \neq 7$ | d) $x \neq -5$ |
| 7. Solve for x : $\frac{1}{x} - \frac{1}{x-1} = \frac{x-5}{3x}$ | a) $2, 4$ | b) $-4, -2$ | c) 4 | d) No solution |

Quadratic Equations, Inequalities, Complex Numbers

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|---|--------------------------------|--------------------------------|-------------------------------|---------------------------------|
| 1. Solve for x : $(x-2)(2x+3) = 0$ | a) $-2, 3$ | b) $-2, -\frac{2}{3}$ | c) $2, \frac{-3}{2}$ | d) $2, \frac{3}{2}$ |
| 2. Solve for x : $x^2 - 4x - 21 = 0$ | a) $-1, 21$ | b) $1, -21$ | c) $3, -7$ | d) $7, -3$ |
| 3. Solve for x : $3x(x-1) = 36$ | a) $4, 13$ | b) $4, -3$ | c) $4, 11$ | d) $-4, 3$ |
| 4. Solve for x : $(x-15)^2 = 28$ | a) $\pm 2\sqrt{7}$ | b) $15 \pm 2\sqrt{7}$ | c) $-15 \pm \sqrt{28}$ | d) 15 |
| 5. Solve for x : $x^2 - 3x - 1 = 0$ | a) $\frac{-3 \pm \sqrt{5}}{2}$ | b) $\frac{3 \pm \sqrt{13}}{2}$ | c) $\frac{3 \pm \sqrt{5}}{2}$ | d) $\frac{-3 \pm \sqrt{13}}{2}$ |
| 6. What number must be added to complete the square? $x^2 - 3x$ | a) $\frac{3}{2}$ | b) 9 | c) $-\frac{9}{4}$ | d) $\frac{9}{4}$ |
| 7. Multiply: $(2 - \sqrt{-2})(3 - \sqrt{-2})$ | a) 4 | b) $8 - 5i\sqrt{2}$ | c) $4 - 5i\sqrt{2}$ | d) 8 |

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|--|-------------------------------------|---------------------|--------------------|-------------------|
| 8. Solve: $x^2 - 2x - 3 < 0$ | a) $(-\infty, -1) \cup (3, \infty)$ | b) $(-1, 3)$ | | |
| | c) $(-\infty, -3) \cup (1, \infty)$ | d) $(-3, 1)$ | | |
| 9. Solve: $x^4 - 10x^2 + 9 = 0$ | a) 1, 3 | b) $\pm i, \pm 3i$ | c) 1, -3 | d) $\pm 1, \pm 3$ |
| 10. Solve for x: $\frac{x-9}{x+2} = \frac{x+7}{x+3}$ | a) $\frac{41}{3}$ | b) $-\frac{41}{15}$ | c) $-\frac{13}{3}$ | d) No solution |

Logarithm and Exponential Expressions

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|---|-----------------------|---------------------|---------------------|---------------------------------|
| 1. Simplify: $9^{\frac{3}{2}}$ | a) $\frac{1}{27}$ | b) 27 | c) $\frac{27}{2}$ | d) $\frac{27}{18}$ |
| 2. Write this equation in logarithmic form: $5^3 = 125$ | a) $\log_{125} 5 = 3$ | b) $\log_3 125 = 5$ | c) $\log_5 125 = 3$ | d) $\log_{\frac{1}{3}} 125 = 5$ |
| 3. Solve for x: $\log_2(x+7) - \log_2 x = 3$ | a) -7 | b) -7, 1 | c) 8 | d) 1 |
| 4. Solve for x: $9^{5x} = 27^{2x-4}$ | a) -5 | b) -3 | c) -2 | d) 3 |
| 5. Evaluate: $\log_3 27$ | a) 3 | b) 5 | c) 4 | d) 7 |

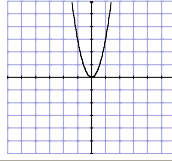
Radical Expressions and Equations

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|--|------------------------------|------------------------------|-------------------------------|------------------------------|
| 1. Simplify: $\sqrt{32}$ | a) $2\sqrt{2}$ | b) $4\sqrt{2}$ | c) $\sqrt{8}$ | d) $2\sqrt{8}$ |
| 2. Multiply: $(5 - \sqrt{3})(5 + \sqrt{3})$ | a) 22 | b) $28 - 10\sqrt{3}$ | c) $22 - 10\sqrt{3}$ | d) 16 |
| 3. Multiply: $(\sqrt{3} + \sqrt{2})^2$ | a) 5 | b) 121 | c) $5 + 2\sqrt{6}$ | d) $7\sqrt{6}$ |
| 4. Combine, if possible: $\sqrt{8} - \sqrt{2}$ | a) $\sqrt{6}$ | b) $\sqrt{2}$ | c) $3\sqrt{2}$ | d) 2 |
| 5. Rationalize the denominator: $\frac{4}{\sqrt{7}-2}$ | a) $\frac{4(\sqrt{7}+2)}{3}$ | b) $\frac{4(\sqrt{7}-2)}{3}$ | c) $\frac{4(\sqrt{7}+2)}{45}$ | d) $\frac{4(\sqrt{7}-2)}{9}$ |
| 6. Solve this equation: $\sqrt{5x+6} = x$ | a) -1, 6 | b) -1 | c) 6 | d) No solution |

Graphing

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|---|---------------------------|---------------------------------|---------------------------------|----------------------------------|----------------------------|
| 1. Which equation might describe this line: | | a) $y = \frac{3}{5}x - 3$ | b) $y = -\frac{3}{5}x - 5$ | c) $y = \frac{5}{3}x - 3$ | d) $y = -\frac{5}{3}x - 3$ |
| 2. Write the equation of this line: | | a) $x = 3$ | b) $y = 3$ | c) $y = -3$ | d) $y = 3x$ |
| 3. What is the midpoint the segment connecting $(-2, 0)$ and $(3, 3)$ | a) (1, 3) | b) $(\frac{5}{2}, \frac{3}{2})$ | c) $(\frac{1}{2}, \frac{3}{2})$ | d) $(-\frac{1}{2}, \frac{3}{2})$ | |
| 4. Write the equation of the line with slope $\frac{3}{2}$ and y-intercept -2 | a) $y = \frac{3}{2}x + 2$ | b) $y - 2 = \frac{3}{2}(x + 3)$ | c) $2y = 3x + 2$ | d) $y = \frac{3}{2}x - 2$ | |

5. If the parabola with the equation $y = 3x^2$ is translated 3 units to the left and 4 units up, the equation will be:



a) $y - 4 = 3(x - 3)^2$ b) $y + 4 = 3(x - 3)^2$
 c) $y - 4 = 3(x + 3)^2$ d) $y + 4 = 3(x + 3)^2$

6. The graph of a line is given by $4x - 3y = 5$.
The slope of the line is:

a) -4 b) $\frac{4}{3}$ c) $-\frac{4}{3}$ d) $\frac{5}{3}$

Applications

1. Find the length of the diagonal of a rectangle with a width of 3 inches and length of 2 inches.

a) 6 in b) 5 in c) $\sqrt{13}$ in d) 13 in

2. The right triangles are similar. Find x.

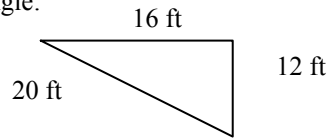
a) 30m b) 15m c) 7m d) 21m



3. The cost of 5 feet of chain is \$2.00. What length of chain may be purchased with \$7.50?

a) 15ft b) 18.75ft c) 37.50ft d) 17.50ft

4. Find the area of this right triangle:



a) 48sq ft b) 192sq ft c) 96sq ft d) 160sq ft

5. The sum of two numbers is 38. One number is ten less than the other. Find the larger number.

a) 14 b) 18 c) 24 d) 28

6. The length of a rectangle is 2 m more than the width. If the perimeter is 9.2 m, how long is the length?

a) 1.2m b) 2.3m c) 3.3m d) 4.3m

Answers Algebra Practice Test

Simplifying and Evaluating Expressions

1)d 2)c 3)d 4)c 5)a 6)c 7)d 8)c 9)d 10)b 11)b 12)c

Polynomials

1)b 2)b 3)b 4)d 5)a

Linear Equations, Inequalities, Systems

1)d 2)a 3)b 4)c 5)a

Rational Expressions and Equations

1)a 2)d 3)b 4)d 4)d 6)c 7)a

Quadratic Equations, Inequalities, Complex Numbers

1)c 2)d 3)b 4)b 5)b 6)d 7)c 8)b 9)d 10)b

Logarithms and Exponential Expressions

1)b 2)c 3)d 4)b 5)a

Radical Expressions and Equations

1)b 2)a 3)c 4)b 5)a 6)c

Graphing

1)a 2)b 3)c 4)d 5)c 6)b

Applications

1)c 2)d 3)b 4)c 5)c 6)c