Topics in Arithmetic and Skills: Arithmetic of integers, fractions and decimals, order relations, exponents and radicals, geometry, order of operations, word problems, proportions, averaging, probability, percents, graph and table interpretation, approximation and estimation.

Resources and references: Any pre-algebra text you can find in your public library contains the topics listed above. Another great resource is the …. Web! Try these sites:

www.free-ed.net/catalog (choose College of Mathematics)

www.purplemath.com/modules/modules.htm

SAMPLE QUESTIONS:

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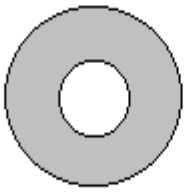
1. In the figure shown below, find the area in square inches of the region between two concentric circles of radii 5 inches and 3 inches.



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2. An article that usually sells for $8.00 is on sale at 20% off. There is a sales tax of 5%. Find the total cost to the buyer of the article.

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3. Locate two numbers r and s on the number line shown below so that $0 < r < s$.

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4. Solve the equation $\frac{4}{3}x - \frac{1}{2} = 0$.

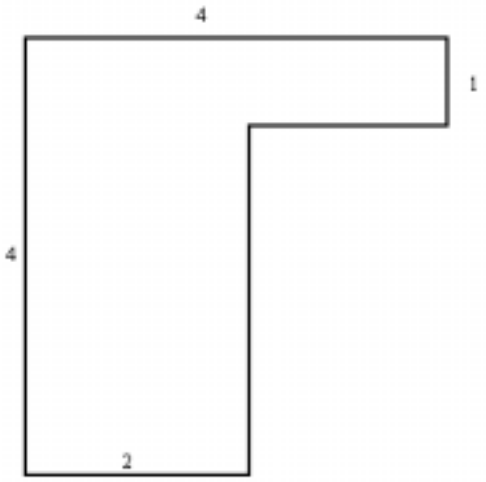
5. Find the value for the expression $-5[4 - (-3)(2)]$.

6. Find a value for the expression $(\frac{5}{3} - 1)^2$.

7. Find the largest number in the list $\sqrt{8}$, $\sqrt{10}$, 3, $\frac{5}{3}$, 2.78.

8. The ratio of water to acid in a certain mixture is 5 to 2. If 50 liters of water are used, then find the number of liters of acid that are needed to make the mixture.

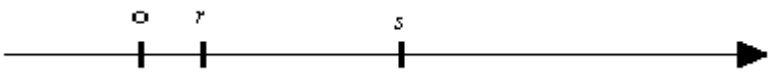
9. Find the area of the right-angled plane figure shown below.



Answers:

1) 16π 2) \$6.72

3)



4) 3/8

5) –50

6) 4/9

7) $\sqrt{10}$

8) 20 liters

9) 10 units^2

Topics in Basic Algebra: Arithmetic of rational numbers, order of operations, operations with algebraic expressions, linear equations and inequalities, factoring and algebraic fractions, exponents and radicals, graphing, fractional and quadratic equations, absolute values, systems of linear equations.

Resources and references: Any text on elementary algebra that you can find in your public library will do. Another great resource is the …. Worldwide Web! Try these sites:

www.free-ed.net/catalog (choose College of Mathematics)

www.purplemath.com/modules/modules.htm

SAMPLE QUESTIONS:

1. Remove parentheses and simplify the expression $(xy^3)^2$.

2. Remove the parentheses and simplify the expression $\sqrt{3}\ (\sqrt{3}\ + 2)$.

3. Solve the equation $\frac{x-3}{8} - \frac{7}{4} = \frac{5}{8.}$

4. Solve the equation $x^2 + 2x = 3$.

5. Remove parentheses and simplify the expression $(2x^2y^3)(-3xy^2)$.

6. Find the x-intercept of the graph of $2x + 3y + 12 = 0$.

7. Remove parentheses and simplify the expression $\left(\frac{x^2-4}{2x}\right)\left(\frac{6}{3x-6}\right)$.

8. Simplify the expression $\dfrac{x+\frac{3}{y}}{y+3}$.

9. If $x = 3$ and $y = -5$, then find the value of the expression $xy - \frac{6y}{x}$.

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10. Solve the equation $5y - 2 = 2x + 3$ for y.

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11. Find the slope of the y-intercept of the line $3x - 5y - 9 = 0$.

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12. In a calculus class, 15 of the students play soccer. Find the total number of students in the class if 3 out of every 5 play soccer.

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13. In the figure below, the large rectangle has dimensions 6 inches by 9 inches. The squares on each corner are 2 inches by 2 inches. Find the area in square inches of the shaded region.

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14. Express $\sqrt{50x^4y^{10}}$ in simplest radical form.

Answers:

1) x^2y^6; 2) $3+2\sqrt{3}$; 3) $x = 22$; 4) $x = 1,-3$; 5) $-6x^3y^5$; 6) $(-6,0)$; 7) $(x+2)/x$

8) $\frac{xy+3}{y(y+3)}$; 9) -5; 10) $y = \frac{2}{5}x + 1$; 11) $m = 3/5, (0,-9/5)$; 12) 25; 13) 38;

14) $5x^2 \mid y \mid^5 \sqrt{2}$.

Topics in Advanced Algebra: Arithmetic of rational numbers, operations with algebraic expressions, linear equations and inequalities, factoring and algebraic fractions, exponents and radicals, graphing and distance, fractional and quadratic equations and inequalities, logarithms, functions, complex numbers, absolute values, systems of equations.

Resources and References: Any text on intermediate or college algebra that you can find in your public library will do. Another great resource is the …. Worldwide Web! Try these sites:

www.free-ed.net/catalog (choose College of Mathematics)

www.purplemath.com/modules/modules.htm

SAMPLE QUESTIONS:

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1. Express $\frac{x}{5y} \div \frac{2x}{3y}$ in simplest form.

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2. If $f(x) = \frac{x+3}{5-x}$ then find a rational expression for $f(a + 4)$.

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3. Factor the expression $x^2 - 3x + 2$.

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4. Find the exact value of the expression $(32)^{2/5} + (16)^{1/4}$.

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5. Find an equation of the line parallel to the line $x + y = 1$ and passing through the point (2, -4).

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6. Find a number b for which $|-(x-7)| = |x-b|$.

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7. If x, y, and z are positive real numbers, find w for which $\log(w) = \log x - \log(y) + 3\log(z)$.

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8. If $f(x) = x^2 + kx + (1 - k)$ and $f(3) = 8$, then find a value for k.

9. Graph the region that corresponds to the inequalities $0 \le y \le 3$ and $x \ge 0$.

Answers:

1) $3/10$; 2) $\dfrac{a+7}{1-a}$; 3) $(x-1)(x-2)$; 4) 6; 5) $x+y=-2$; 6) 7; 7) xz^3/y; 8) $k=-1$

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