

## Equations and Expressions- By Category: Level 2

1	$m = \frac{\left(\frac{r}{1,200}\right)\left(1 + \frac{r}{1,200}\right)^N}{\left(1 + \frac{r}{1,200}\right)^N - 1} P$ <p>The formula above gives the monthly payment <math>m</math> needed to pay off a loan of <math>P</math> dollars at <math>r</math> percent annual interest over <math>N</math> months. Which of the following gives <math>P</math> in terms of <math>m</math>, <math>r</math>, and <math>N</math> ?</p> <p>A) <math>P = \frac{\left(\frac{r}{1,200}\right)\left(1 + \frac{r}{1,200}\right)^N}{\left(1 + \frac{r}{1,200}\right)^N - 1} m</math></p> <p>B) <math>P = \frac{\left(1 + \frac{r}{1,200}\right)^N - 1}{\left(\frac{r}{1,200}\right)\left(1 + \frac{r}{1,200}\right)^N} m</math></p> <p>C) <math>P = \left(\frac{r}{1,200}\right) m</math></p> <p>D) <math>P = \left(\frac{1,200}{r}\right) m</math></p>	Cross Multiply-Rational Level 2-No Calculator
2	<p>If <math>\frac{a-b}{b} = \frac{3}{7}</math>, which of the following must also be true?</p> <p>A) <math>\frac{a}{b} = -\frac{4}{7}</math></p> <p>B) <math>\frac{a}{b} = \frac{10}{7}</math></p> <p>C) <math>\frac{a+b}{b} = \frac{10}{7}</math></p> <p>D) <math>\frac{a-2b}{b} = -\frac{11}{7}</math></p>	Cross Multiply-Rational Level 2-No Calculator

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3	<p>If <math>\frac{t+5}{t-5} = 10</math>, what is the value of <math>t</math> ?</p> <p>A) <math>\frac{45}{11}</math></p> <p>B) 5</p> <p>C) <math>\frac{11}{2}</math></p> <p>D) <math>\frac{55}{9}</math></p>	Cross Multiply-Rational Level 2-No Calculator
4	$I = \frac{P}{4\pi r^2}$ <p>At a large distance <math>r</math> from a radio antenna, the intensity of the radio signal <math>I</math> is related to the power of the signal <math>P</math> by the formula above.</p>	Cross Multiply-Rational Level 2-With Calculator
5	<p>Which of the following expresses the square of the distance from the radio antenna in terms of the intensity of the radio signal and the power of the signal?</p> <p>A) <math>r^2 = \frac{IP}{4\pi}</math></p> <p>B) <math>r^2 = \frac{P}{4\pi I}</math></p> <p>C) <math>r^2 = \frac{4\pi I}{P}</math></p> <p>D) <math>r^2 = \frac{I}{4\pi P}</math></p>	Cross Multiply-Rational Level 2-With Calculator
6	$9a^4 + 12a^2b^2 + 4b^4$ <p>Which of the following is equivalent to the expression shown above?</p> <p>A) <math>(3a^2 + 2b^2)^2</math></p> <p>B) <math>(3a + 2b)^4</math></p> <p>C) <math>(9a^2 + 4b^2)^2</math></p> <p>D) <math>(9a + 4b)^4</math></p>	Factoring Polynomial Level 2-No Calculator
7	$h(x) = \frac{1}{(x-5)^2 + 4(x-5) + 4}$ <p>For what value of <math>x</math> is the function <math>h</math> above undefined?</p>	Factoring Polynomials Level 2-With Calculator

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8	<table border="1" data-bbox="496 264 669 470"><thead><tr><th><math>x</math></th><th><math>f(x)</math></th></tr></thead><tbody><tr><td>0</td><td>3</td></tr><tr><td>2</td><td>1</td></tr><tr><td>4</td><td>0</td></tr><tr><td>5</td><td>-2</td></tr></tbody></table> <p>The function <math>f</math> is defined by a polynomial. Some values of <math>x</math> and <math>f(x)</math> are shown in the table above. Which of the following must be a factor of <math>f(x)</math> ?</p> <p>A) <math>x - 2</math> B) <math>x - 3</math> C) <math>x - 4</math> D) <math>x - 5</math></p>	$x$	$f(x)$	0	3	2	1	4	0	5	-2	Factoring Polynomial Level 2-No Calculator
$x$	$f(x)$											
0	3											
2	1											
4	0											
5	-2											
9	$x^3 - 5x^2 + 2x - 10 = 0$ <p>For what real value of <math>x</math> is the equation above true?</p>	Factoring Polynomial Level 2-No Calculator										
10	$g(x) = ax^2 + 24$ <p>For the function <math>g</math> defined above, <math>a</math> is a constant and <math>g(4) = 8</math>. What is the value of <math>g(-4)</math> ?</p> <p>A) 8 B) 0 C) -1 D) -8</p>	Function Level 2-No Calculator										
11	<p>Which of the following equations has a graph in the <math>xy</math>-plane for which <math>y</math> is always greater than or equal to <math>-1</math> ?</p> <p>A) <math>y =  x  - 2</math> B) <math>y = x^2 - 2</math> C) <math>y = (x - 2)^2</math> D) <math>y = x^3 - 2</math></p>	Graphs and Equations Level 2-No Calculator										

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12	<p>Which of the following numbers is NOT a solution of the inequality <math>3x - 5 \geq 4x - 3</math> ?</p> <p>A) -1 B) -2 C) -3 D) -5</p>	Inequalities Level 2-With Calculator
13	$y < -x + a$ $y > x + b$ <p>In the <math>xy</math>-plane, if <math>(0, 0)</math> is a solution to the system of inequalities above, which of the following relationships between <math>a</math> and <math>b</math> must be true?</p> <p>A) <math>a &gt; b</math> B) <math>b &gt; a</math> C) <math> a  &gt;  b </math> D) <math>a = -b</math></p>	Inequalities Level 2-With Calculator
14	$y \leq -15x + 3000$ $y \leq 5x$ <p>In the <math>xy</math>-plane, if a point with coordinates <math>(a, b)</math> lies in the solution set of the system of inequalities above, what is the maximum possible value of <math>b</math> ?</p>	Inequalities Level 2-With Calculator
15	$\sqrt{x - a} = x - 4$ <p>If <math>a = 2</math>, what is the solution set of the equation above?</p> <p>A) <math>\{3, 6\}</math> B) <math>\{2\}</math> C) <math>\{3\}</math> D) <math>\{6\}</math></p>	solving using Sqrt/ sqrd Level 2-No Calculator
16	$3x + 4y = -23$ $2y - x = -19$ <p>What is the solution <math>(x, y)</math> to the system of equations above?</p> <p>A) <math>(-5, -2)</math> B) <math>(3, -8)</math> C) <math>(4, -6)</math> D) <math>(9, -6)</math></p>	system of equations Level 2-No Calculator

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17	$b = 2.35 + 0.25x$ $c = 1.75 + 0.40x$ <p>In the equations above, <math>b</math> and <math>c</math> represent the price per pound, in dollars, of beef and chicken, respectively, <math>x</math> weeks after July 1 during last summer. What was the price per pound of beef when it was equal to the price per pound of chicken?</p> <p>A) \$2.60 B) \$2.85 C) \$2.95 D) \$3.35</p>	system of equations Level 2-No Calculator
18	$x + y = -9$ $x + 2y = -25$ <p>According to the system of equations above, what is the value of <math>x</math> ?</p>	system of equations Level 2-No Calculator
19	$kx - 3y = 4$ $4x - 5y = 7$ <p>In the system of equations above, <math>k</math> is a constant and <math>x</math> and <math>y</math> are variables. For what value of <math>k</math> will the system of equations have no solution?</p> <p>A) <math>\frac{12}{5}</math> B) <math>\frac{16}{7}</math> C) <math>-\frac{16}{7}</math> D) <math>-\frac{12}{5}</math></p>	system of equations Level 2-No Calculator