Practice Problems for Algebra
from www.topmath.info

1 What is the value of 6t if t = 10y + 4 and y = 7?

2 What is the value of -6s if s = 5w - 4 and w = 3?

3 What is the value of -10s if s = -6x + 9 and x = 2?

4 Let f(x) = x - 2, and let g(x) = (x^2 - 4)/(x + 2). What is the difference between these two functions?

5 We define a new operator, @, such that a @ b = a^b ÷ b^a. What is 4 @ 3?

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6 (T/F): 4 = 3

7 (T/F): -2 = -3

8 (<, =, or >): Which symbol goes in the space to make the statement -8 ___ 0 true?

9 Find the range(s) for x that satisfy the condition 21 - x^2 >= -7x - 57 ?

10 If 11x + 7 = 13, what is x?

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11 The simultaneous equations $4p + 8q = 44$ and $20p - kq = 225$ cannot be solved for what value of k?

12 The cube of the sum of p and 5 equals the product of p and 5. Write this fact as an equation.

13 If $12/21 = 12/(39-r)$, what is r?

14 A movie company uses a machine that costs 600 dollars to produce DVDs. Blank DVDs cost $37 per box of 100. How many dollars does it cost for the equipment and blanks to produce q DVDs, assuming that q is a multiple of 100?

15 If $y = 8x$, what is the value of y when $x = 6$?

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1 ANSWER: 444. EXPLANATION: If t = 10y + 4 and y = 7, then we substitute 7 for y and find that t = 10×7 + 4, or 74. Since the question asks us to find the value of 6t, we simply multiply 6 by 74 to get the answer.

2 ANSWER: -66. EXPLANATION: If s = 5w - 4 and w = 3, then we substitute 3 for w and find that s = 5×3 - 4, or 11. Since the question asks us to find the value of -6s, we simply multiply -6 by 11 to get the answer.

3 ANSWER: 30. EXPLANATION: If s = -6x + 9 and x = 2, then we substitute 2 for x and find that s = -6×2 + 9, or -3. Since the question asks us to find the value of -10s, we simply multiply -10 by -3 to get the answer.

4 ANSWER: The functions are identical, other than g(x) being undefined where x=-2.. EXPLANATION: Divide the denominator of g(x) into the numerator of g(x) to see that the functions appear to be identical. However, note that g(x) is undefined when the denominator is 0, because division by 0 is undefined.

5 ANSWER: 64/81. EXPLANATION: By the definition of the function, 4 @ 3 = 4^3 ÷ 3^4. We know that 4^3=64, and 3^4=81. We then divide to get the answer.

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6 ANSWER: False. EXPLANATION: Since 4 is not the same as 3, this is false, because the = symbol means they are the same.

7 ANSWER: False

8 ANSWER: <

9 ANSWER: -6 <= x <= 13. EXPLANATION: Add x^2 to both sides of the equation, and subtract 21 from both sides of the equation, and you get 0 >= x^2 - 7x - 78. Factor, and you get 0 >= (x - 13)(x + 6). The right side of the equation equals 0 when x = 13 or x = -6, and it is less than 0 when x < 13 but x > -6.

10 ANSWER: 6/11. EXPLANATION: Begin by subtracting 7 from both sides of the equation, which yields 11x = 6. Then divide both sides by 11 to get x = 6/11.

11 ANSWER: -40. EXPLANATION: If k = -40, then the left side of the second equation is exactly 5 times the left side of the first equation. However, the right side of the second equation is not 5 times the right side of the first equation, so the two equations have no solution.

12 ANSWER: (p + 5)^3 = 5p. EXPLANATION: The sum of p and 5 is simply p + 5. To cube it, we must put parentheses around it, because raising a number to a power is higher in the order of operations than adding. In other words, if we wrote p + 5^3, only the 5 would be cubed. To finish, we simply write an equals sign (=), and then the product of p and 5, which is simply 5p.

13 ANSWER: 18. EXPLANATION: Because the numerators on both sides of the equals sign are the same, the denominators must also be the same. Therefore, we simply need to solve the equation 39-r=21.

14 ANSWER: 600 + 0.37q. EXPLANATION: The fixed cost is the cost of the equipment. Then for each additional DVD, we add 1/100th of the cost of a box of 100.

15 ANSWER: 48