

Practice Problems for Algebra
from www.topmath.info

1 (T/F): $-8 < -4$

2 Find the range(s) for x that satisfy the condition $1 - x^2 \leq -5x - 13$?

3 If $8x - 10 = 14$, what is x ?

4 If f and g are real numbers such that the sum of f and 9 is g , what is the product of 9 and f in terms of g ?

5 The square of the sum of w and 4 equals the product of w and 4. Write this fact as an equation.

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6 If $11/17 = 11/(s+4)$, what is s ?

7 If $7/11 = 7/(13-v)$, what is v ?

8 Find the value of $G + (H^2)/72$ when $G=20$ and $H=18$.

9 If $y = 5x^2 + 10x - 10$, what is the value of y when $x = 2$?

10 What is the value of $11t$ if $t = 8x + 9$ and $x = 6$?

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11 What is the value of $-9r$ if $r = 2s - 6$ and $s = 7$?

12 What is the value of $-5t$ if $t = -7u + 2$ and $u = 4$?

13 Let $f(x) = x - 8$, and let $g(x) = \frac{x^2 - 64}{x + 8}$. What is the difference between these two functions?

14 We define a new operator, $@$, such that $a @ b = a^b \div b^a$. What is $2 @ 4$?

15 (T/F): $10 = 10$

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1 ANSWER: True

2 ANSWER: $x \geq 7$ and $x \leq -2$. EXPLANATION: Add x^2 to both sides of the equation, and subtract 1 from both sides of the equation, and you get $0 \leq x^2 - 5x - 14$. Factor, and you get $0 \leq (x - 7)(x + 2)$. The right side of the equation equals 0 when $x = 7$ or $x = -2$, and it is greater than 0 when $x > 7$ or $x < -2$.

3 ANSWER: 3. EXPLANATION: Begin by adding 10 to both sides of the equation, which yields $8x = 24$. Then divide both sides by 8 to get $x = 24/8$. Finally, convert this improper fraction to the correct form, 3.

4 ANSWER: $9(g-9)$. EXPLANATION: The problem asks for the product of 9 and f , which is obviously $9f$. However, it asks for this sum in terms of g . Since we know that $9 + f = g$, then $f = g-9$, and we can use this equation to substitute for f to get the answer in terms of g .

5 ANSWER: $(w + 4)^2 = 4w$. EXPLANATION: The sum of w and 4 is simply $w + 4$. To square 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 $w + 4^2$, only the 4 would be squared. To finish, we simply write an equals sign (=), and then the product of w and 4, which is simply $4w$.

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6 ANSWER: 13. 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 $s+4=17$.

7 ANSWER: 2. 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 $24-v=11$.

8 ANSWER: $24 \frac{1}{2}$. EXPLANATION: Notice that H (18) goes into the denominator of the fraction exactly 4 times. Therefore, the fraction reduces to $\frac{18}{4}$. Add this to the value of G (20) to obtain the answer.

9 ANSWER: 30

10 ANSWER: 627. EXPLANATION: If $t = 8x + 9$ and $x = 6$, then we substitute 6 for x and find that $t = 8 \times 6 + 9$, or 57. Since the question asks us to find the value of $11t$, we simply multiply 11 by 57 to get the answer.

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11 ANSWER: -72. EXPLANATION: If $r = 2s - 6$ and $s = 7$, then we substitute 7 for s and find that $r = 2 \times 7 - 6$, or 8. Since the question asks us to find the value of $-9r$, we simply multiply 9 by 8 to get the answer.

12 ANSWER: 130. EXPLANATION: If $t = -7u + 2$ and $u = 4$, then we substitute 4 for u and find that $t = -7 \times 4 + 2$, or -26. Since the question asks us to find the value of $-5t$, we simply multiply -5 by -26 to get the answer.

13 ANSWER: The functions are identical, other than $g(x)$ being undefined where $x = -8$.
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.

14 ANSWER: 1. EXPLANATION: By the definition of the function, $2 @ 4 = 2^4 \div 4^2$. We know that $2^4 = 16$, and $4^2 = 16$. We then divide to get the answer.

15 ANSWER: True. EXPLANATION: Since the numbers on both sides of the = symbol are the same, this is true.