Algebra Worksheet: Solutions

Review Problems

1. $7x + 5x$

$12x$

2. $9x^2 - x^2$

$8x^2$

3. $9y + 5y^2 + 3y + 4y^2$

$9y^2 + 12y$

4. $7(4t - 5) - 8t$

$20t - 35$

5. $7 - 4[3 - (4s - 5)]$

$16s + 25$

6. $14n^2 + 5 - [7(n^2 - 2) + 4]$

$7n^2 + 15$

7. $(-3v^2k^{-5})^3(2v^4k^7)^2$

$-108v^{14}k^{-1}$

8. $(5 + \sqrt{7})(3 - \sqrt{2})$

$15 - 5\sqrt{2} + 3\sqrt{7} - \sqrt{14}$

1 Linear Equations in one variable

Practice Problems

1. $\frac{5}{4}s + \frac{1}{2} = 2s - \frac{1}{2}$

$s = \frac{4}{3}$

2. $.35y - .2 = .15y + 1$

$y = 6$

3. A student on a scooter is initially traveling at 23 m/s. (Yes. She's bookin' it.) Find how long it takes her (in seconds) to reach a velocity of 31 m/s if her acceleration is 2 m/s^2. (Hint: Use the equation $V_f = V_i + at$ where V_f is her final velocity, V_i is her initial velocity, a is her acceleration, and t is time.)

$t = 4$

2 Linear Equations in Two Variables

Practice Problems

Solve this system using the substitution method:

1. $\begin{cases} 4x + y = 5 \\ 2x - 3y = 13 \end{cases}$

(2,-3)

Solve this system using the elimination method:

2. $\begin{cases} 2x - 3y = 4 \\ 4x + 5y = 3 \end{cases}$

$(\frac{29}{22}, \frac{-5}{11})$

3. The sum of Orion and Sagan's age is 24, and the difference between their ages is 6. Find their ages given that Orion is older than Sagan.

Orion is 15 and Sagan is 9.

4. A landscaping company placed two orders with a nursery. The first order was for 13 bushes and 4 trees, and totalled $487. The second order was for 6 bushes and 2 trees, and totalled $232. The bills do not list the per-item price. What were the costs of one bush and of one tree?

Trees are $47.00 and bushes are $23.00.

3 Quadratic Equations

Practice Problems

1. Solve by factoring: $x^2 + x = 42$

(-7,6)

2. Solve by using the Quadratic Formula: $x^2 + 10x + 25$

$x = -5$

3. An object is launched at 19.6 m/s from a 58.8 meter tall platform. The equation for the object's height s at time t seconds after launch is $s(t) = -4.9t^2 + 19.6t + 58.8$, where s is in meters. When does the object strike the ground? Note that you will get two answers. (Hint: You are looking for the time when the object hits the ground so set the equation equal to zero and solve for t.)

(-2,6) $t = 6$

First, solve the kinetic energy equation for z^2.

$\frac{sx^2+ty^2-sw^2}{t} = z^2$

Now solve the momentum equation for z.

$\frac{sx+ty-sw}{t} = z$

We can square what you found in the step above to find another expression for z^2.

$\left(\frac{sx+ty-sw}{t}\right)^2 = z^2$

Set the two expressions we found for z^2 equal to one another and you'll see what I mean. (Just write it in the space. Don't solve anything yet.)

$\left(\frac{sx+ty-sw}{t}\right)^2 = \frac{sx^2+ty^2-sw^2}{t}$

Did you get
$\frac{s^2x^2+t^2y^2+s^2w^2+2stxy-2s^2xw-2styw}{t^2} = \frac{sx^2+ty^2-sw^2}{t}$

Next, multiply both sides by t^2 to clear the fractions.

$s^2x^2 + t^2y^2 + s^2w^2 + 2stxy - 2s^2xw - 2styw = stx^2 + t^2y^2 - stw^2$

We can simplify a little by subtracting the t^2y^2 terms from both sides.

$s^2x^2 + s^2w^2 + 2stxy - 2s^2xw - 2styw = stx^2 + -stw^2$ Now, move both terms from the right side of the equation to the left side by adding one term to both sides and subtracting the other from both sides. You should end up with zero on the right side.

$s^2x^2 + s^2w^2 + 2stxy - 2s^2xw - 2styw - stx^2 + stw^2 = 0$

First, find $-b$.

$2s^2x + 2sty$

Now, b^2

$4s^4x^2 + 8s^3xty + 4s^2t^2y^2$

Next, $4ac$

$4s^2x^2 + 8s^3txy + 8s^2t^2xy - 4s^3t^2x^2$