BECA / Dr. Huson / Geometry
Unit 9: Algebra
18 March 2022

Name: Solutions

9.1 Classwork: Algebra skills assessment

Do not use a calculator. Do not convert values to decimals.
Reference: Chili Math, Solving Literal Equations
https://www.chilimath.com/lessons/intermediate-algebra/literal-equations/

Simplify each expression by "collecting like terms"

1. (a) $2x + 4 - x + 11$

$= x + 15$

(b) $5y - 4 - 7y + y$

$= -5y - 4$

(c) $14 + 5\pi - 2\pi + 4$

$= 3\pi + 18$

(d) $2a + \sqrt{5} + 7a + 3\sqrt{5}$

$= 9a + 4\sqrt{5}$

(e) $x\sqrt{3} - x\sqrt{3} + x + 1$

$= x + 1$

(f) $3\pi x + 4 + 2\pi x - 7$

$5\pi x - 3$

Solve each equation for the unknown

One step.

2. (a) $2x = 12$

$x = 6$

(b) $4z = -8$

$z = -2$

(c) $3a = \pi$

$a = \frac{\pi}{3}$

(d) $2y = \sqrt{5}$

$y = \frac{\sqrt{5}}{2}$

Two steps.

3. (a) $7x + 4 = 11$

$x = 1$

(b) $-4b + 5 = -3$

$b = 2$

(c) $4m - \sqrt{2} = 3\sqrt{2}$

$m = \sqrt{2}$

(d) $2y - 3\pi = \pi$

$y = 2\pi$

4. Fractional coefficients

(a) $\frac{1}{2}(6-2x) = 4x$

$x = \frac{3}{5}$

(b) $11 = \frac{1}{3}x + 2x - 10$

$\frac{7}{3}x = 21$

$x = 9$

Working with polynomials

5. Simplify each expression by "collecting like terms"

(a) $4x^2 + 3x - 7 - 2x^2 - x + 4$

$= 2x^2 + 2x - 3$

(b) $3(a^2 - 2a + 1) - 2(a^2 - a - 4)$

$= a^2 - 4a + 11$

Slope-intercept form

6. What is the slope and y-intercept of each equation?

(a) $y = 2x - 3$

$m = 2$

$b = -3$

(b) $4x + 2y = 6$

$y = -2x + 3$

$m = -2$

$b = 3$

Function substitution

7. (a) Given $f(x) = 4x + 7$.
Simplify $f(2)$.

$= 4(2) + 7$

$= 15$

(b) Given $f(x) = -\frac{(12+4x)}{11}$.
Simplify $f(-3)$.

$= -\frac{(12 + 4(-3))}{11}$

$= 0$

Name: Solutions

Parallel and perpendicular linear equations

8. What is the equation of the line with a slope of 2 passing through the point $(0, 1)$? hint: $y - y_1 = m(x - x_1)$

$y - 1 = 2x$

9. What is the equation of a line parallel to $y = -2x + 1$ with a y-intercept of 4?

$y = -2x + 4$

10. What is the slope of a line perpendicular to the line $x - 2y = 16$?

$y = \frac{1}{2}x - 8$

$m = \frac{1}{2}$, $m_\perp = -2$

Rounding and calculations

11. Perform each calculation, writing down the full calculator display and then rounding to the *nearest hundredth*.

(a) $A = 15.944732$

≈ 15.94

(b) $W = 3.4 \times 9.8 \times 4.3 \times 0.15$

$= 21.4914$

≈ 21.49

(c) $V = \frac{1}{3}\pi(3.4)^2(6.1)$

$= 73.84418\ldots$

≈ 73.84

(d) $P = 8.6 + \frac{1}{2}\pi(8.6)$

$= 22.108844\ldots$

≈ 22.11

(e) $V = 199.19711$

≈ 199.20

(f) $W = \frac{1}{3}(13)3.3^2 \times 1.175$

$= 55.44825$

≈ 55.45

(g) $V = \frac{1}{3}\pi(12.4)^2(8.1)$

$= 1304.2384\ldots$

≈ 1304.24

(h) $P = 12 + \frac{1}{4}\pi(12)$

$= 21.42477\ldots$

≈ 21.42

12. Oceanside Bike Rental Shop charges a 17 dollar bike fee plus 6 dollars an hour for renting a bike. Jeffrey paid 53 dollars total. How many hours did he pay to have the bike checked out?

$C = 6x + 17 = 53$

$x = 6$ hours

13. Three friends go bowling. The cost per person per game is \$5.30. The cost to rent shoes is \$2.50 per person. Their total cost is \$55.20. How many games did they play?

$C = 3x(5.30) + 3(2.50) = 55.20$

$= 47.70$

$15.90x$

$x = 3$ hours

$3 \times 3 = 9$ games

14. The admission fee at a small fair is \$1.50 for children and \$4.00 for adults. On a certain day, 40 people enter the fair and \$85.00 is collected. How many children and how many adults attended?

y adults, x children

$x + y = 40$

$1.50x + 4.00y = 85.00$

$1.50(40 - y) + 4y = 85$

$2.5y = 25$

$y = 10$ adults

$x = 30$ children

Check

$45 + 40 = 85$ ✓