

1a. $2s - 1 = 6s - 5 \Rightarrow -4s = -4 \Rightarrow s = 1$

1b. $5x - 12 = 2x - 6 \Rightarrow 3x = 6 \Rightarrow x = 2$

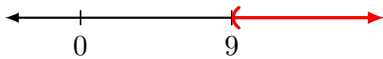
2. $2A = h(b + B) \Rightarrow 2A = hb + hB \Rightarrow hB = 2A - hb \Rightarrow B = \frac{2A - hb}{h}$

3. Let x be the pre-tax amount. Then $x + 0.07x = 2378 \Rightarrow 1.07x = 2378 \Rightarrow x = 2222.4299$. That is, the pre-tax amount is \$2222.43, so the amount of the tax is $\$2378 - \$2222.43 = \$155.57$.

4. Let x be the number of moons that Ceti Alpha VI has, in which case Ceti Alpha V has $3x$ moons and Ceti Alpha VII has $2x + 2$ moons. The total is 26 moons, so $x + 3x + (2x + 2) = 26$ is the equation. Solving gives $6x = 24$ and finally $x = 4$. That is, Ceti Alpha VI has 4 moons, Ceti Alpha V has 12 moons, and Ceti Alpha VII has 10 moons.

5. Let x equal the number of liters of 18% solution to be added. Then $0.18x + 0.68(20) = 0.60(x + 20)$, which leads to $0.18x + 13.60 = 0.60x + 12 \Rightarrow 0.42x = 1.60 \Rightarrow x = \frac{1.60}{0.42} = 3.81 \approx 3.8$ L.

6a. $-3x < -27 \Rightarrow x > 9 \Rightarrow (9, \infty)$



6b. $-6 \leq 2t \leq 12 \Rightarrow -3 \leq t \leq 6 \Rightarrow [-3, 6]$



7a. $x \leq 15$ and $x \geq -7 \Rightarrow -7 \leq x \leq 15 \Rightarrow [-7, 15]$.

7b. $3x < 24$ or $x > 10 \Rightarrow x < 8$ or $x > 10 \Rightarrow (-\infty, 8) \cup (10, \infty)$.

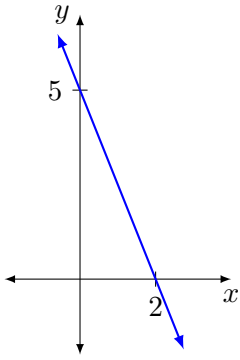
8. $7 - 3x = 16$ or $7 - 3x = -16 \Rightarrow -3x = 9$ or $-3x = -23 \Rightarrow x = -3$ or $x = \frac{23}{3} \Rightarrow \{-3, \frac{23}{3}\}$

9a. $3r - 1 > 11$ or $3r - 1 < -11 \Rightarrow r > 4$ or $r < -\frac{10}{3} \Rightarrow (-\infty, -\frac{10}{3}) \cup (4, \infty)$

9b. $|y + 5| \leq 5 \Rightarrow -5 \leq y + 5 \leq 5 \Rightarrow -10 \leq y \leq 0 \Rightarrow [-10, 0]$

9c. No solution, since the absolute value of a number cannot ever be negative in value.

10. x -intercept is $(2, 0)$, and y -intercept is $(0, 5)$.



11. Midpoint is at $\left(\frac{2+6}{2}, \frac{-3-8}{2}\right) = \left(4, -\frac{11}{2}\right)$

12. One line has equation $y = 2x - 3$ and thus slope 2, and the other line has equation $y = -\frac{1}{2}x + \frac{3}{2}$ and thus slope $-\frac{1}{2}$. Since the slopes are negative reciprocals, the lines are perpendicular.

13. Slope of the line is $m = \frac{10 - (-3)}{-8 - (-2)} = -\frac{13}{6}$, and so equation is $y - (-3) = -\frac{13}{6}(x + 2)$. Slope-intercept form: $y = -\frac{13}{6}x - \frac{22}{3}$; standard form: $13x + 6y = -44$.

14. The line $4x - y = 7$, which can be written $y = 4x - 7$, has slope 4. Thus, the line whose equation we must find has point $(-2, -3)$ and slope 4 also, which gives us the equation $y + 3 = 4(x + 2)$ by the point-slope formula. Slope-intercept form: $y = 4x + 5$. Standard form: $4x - y = -5$.

15a. $2y^{-5} = \frac{2}{y^5}$

15b. $(t^5)^{-3}t^7 = t^{-15}t^7 = t^{-8} = \frac{1}{t^8}$