1a. $t - 4 = 6t - 4 \Rightarrow t = 6t \Rightarrow -5t = 0 \Rightarrow t = 0$

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

2a. $4x \leq -32 \Rightarrow x \leq -8$, so solution set is $(-\infty, -8]$

2b. $-18 < 3t \leq -12 \Rightarrow -6 < t \leq -4$ so solution set is $(-6, -4]$

3. $2A = hB + hb \Rightarrow hB = 2A - hb \Rightarrow B = \dfrac{2A - bh}{h}$

4. Letting n be the number: $13 - 8n$

5a. $x \leq 6$ and $x \geq 2 \Rightarrow 2 \leq x \leq 6 \Rightarrow [2, 6]$

5b. $2x < 22$ or $x > 14 \Rightarrow x < 11$ or $x > 14 \Rightarrow (-\infty, 11) \cup (14, \infty)$

6. $3x - 7 = 23$ or $3x - 7 = -23 \Rightarrow 3x = 30$ or $3x = -16 \Rightarrow x = 10, -16/3$, so solution set is $\{-16/3, 10\}$.

7. $-9 < 2x + 7 < 9 \Rightarrow -16 < 2x < 2 \Rightarrow -8 < x < 1$, so solution set is $(-8, 1)$.

8a. x-intercept is $(6, 0)$ and y-intercept is $(0, -3/2)$.

8b. Omitted.

9. $\left(\dfrac{-1/2 + 3/2}{2}, \dfrac{1/3 + 5/3}{2} \right) = \left(\frac{1}{2}, 1 \right)$

10. $m = \dfrac{-3 - 2}{9 - 5} = -\dfrac{5}{4}$

11. If x is the length of the middle side, then: $x + (x - 75) + (x + 375) = 3075 \Rightarrow 3x = 2775 \Rightarrow x = 925$. So middle side is 925 miles, short side is 850 miles, and long side is 1300 miles.

12. Let x be the amount invested at 3%, so $\$24,000 - x$ is the amount invested at 8%. We have $0.03x + 0.08(24,000 - x) = 1545$, from which we get $-0.05x + 1920 = 1545 \Rightarrow -0.05x = -375 \Rightarrow x = 7500$. Thus \$7,500 was invested at 3%, and \$16,500 was invested at 8%.

13. Let x be the number of liters of 18% alcohol to be added, so $0.18x + 0.50(20) = 0.30(x + 20) \Rightarrow 0.18x + 10 = 0.30x + 6 \Rightarrow 0.12x = 4 \Rightarrow x = 100/3$. Thus $33\frac{1}{3}$ liters of 18% alcohol must be added.

14. Slope is $m = \dfrac{10 - 5}{-8 - (-2)} = \dfrac{5}{-6} = -\dfrac{5}{6}$, so point-slope formula gives $y - 5 = -\frac{5}{6}(x - (-2)) \Rightarrow y = -\frac{5}{6}x + \frac{10}{3}$, which is slope-intercept form. Standard form: $5x + 6y = 20$.

15a. $5u^{-8} = \dfrac{5}{u^8}$

15b. $(-2x^9)^5 = -32x^{45}$

15c. $3v^2(-5v^{-6})(-2v)^0 = 3v^2(-5v^{-6}) = -15v^2v^{-6} = -15v^{-4} = -\dfrac{15}{v^4}$

15d. $\dfrac{4a^5(a^{-1})^3}{(a^{-2})^{-4}} = \dfrac{4a^5a^{-3}}{a^8} = \dfrac{4a^2}{a^8} = \dfrac{4}{a^6}$

16. $(2z^2 + 3z - 1) + (4z^2 + 5z + 6) = 2z^2 + 3z - 1 + 4z^2 + 5z + 6 = 6z^2 + 8z + 5$

17. $(9y^2 - 11y + 5) - (4y^2 - 3y + 7) = 9y^2 - 11y + 5 - 4y^2 + 3y - 7 = 5y^2 - 8y - 2$

18a. $(4k + 3)(3k - 2) = 12k^2 - 8k + 9k - 6 = 12k^2 + k - 6$

18b. $(4n + 3m)^2 = (4n + 3m)(4n + 3m) = 16n^2 + 24mn + 9m^2$

18c. $[(m+p)+5][(m+p)-5] = (m+p)^2-5(m+p)+5(m+p)-5^2 = (m+p)(m+p)-25 = m^2+2mp+p^2-25$