

Solutions - Algebra 1 - Individual

2/19/94

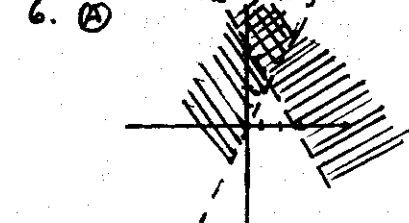
1. (A) $-(-3|-5|) + (-1-7+2) + 1-20$
 $15 + (-5) + 20 = 30$

2. (A) $a \times b = 2a + b + 1$
 $-3 \times 2 = 2(-3) + 2 + 1$
 $= -6 + 2 + 1 = -3$

3. (C) $.05n + .10d = .90$
 $100(.05n + .10d) = .90(100)$
 $5n + 10d = 90$

4. (B) $\frac{6^x}{2^x} = \frac{(3 \cdot 2)^x}{2^x} = \frac{3^x \cdot 2^x}{2^x} = 3^x$

5. (D) $x = \text{smaller integer}$
 $92 - x = \text{larger integer}$
 $\frac{92-x}{x} = 3 + \frac{12}{x}$
 $92-x = 3x + 12$
 $80 = 4x$
 $20 = x, 92-x = 72$



7. (C) $x^2 - \frac{3}{2}x + \frac{9}{16} + x^2 - \frac{5}{4}x + \frac{3}{8} = 0$
 $2x^2 - \frac{11}{4}x + \frac{15}{16} = 0$
 $32x^2 - 44x + 15 = 0$
 $(8x-5)(4x-3) = 0$
 $x = \frac{5}{8}, x = \frac{3}{4}$

8. (C) $\frac{-65}{-80} + \frac{75}{+90} = \frac{-145}{-165} + \frac{75}{165} = 20$

9. (B) $x^2 - 3x - 4 = 0$
 $(x-4)(x+1) = 0$
 $a = x = 4, x = -1 = b$
 $\frac{a}{b} = \frac{4}{-1}$

10. (A) $\frac{a+x}{b+x} = \frac{c}{d}$
 $ad + dx = cb + cx$
 $ad - cb = cx - dx$
 $ad - cb = (c-d)x$
 $\frac{ad - cb}{c-d} = x$

11. (B) $x = 1^{\text{st}}$
 $x+3 = 2^{\text{nd}}$
 $x+6 = 3^{\text{rd}}$
 $x + x+3 + x+6 = 33$
 $3x+9 = 33$
 $3x = 24$
 $x = 8$
 $x+3 = 11$
 $x+6 = 14$

12. (A) $\frac{x+y+x-y}{x+y-(x-y)} = \frac{x+y-(x-y)}{x+y+x-y}$
 $\frac{2x}{2y} = \frac{2y}{2x} = \frac{x}{y} = \frac{y}{x} = \frac{x^2-y^2}{xy}$

13. (D) $3x + 5x + 11x = 323$
 $19x = 323$
 $x = 17$
 $3x = 51$
 $5x = 85$
 $11x = 187$

14. (C) $[-\frac{1}{125}]^{-2/3} = (-125)^{2/3} = (-5)^2 = 25$

15. (A) $\frac{8c-7d}{d} = 2$
 $8c-7d = 2d$
 $8c = 9d$
 $c = \frac{9}{8}d$
 $\frac{5c-6d}{2c} = \frac{5(\frac{9}{8}d)-6d}{2(\frac{9}{8}d)} = \frac{\frac{45}{8}d - 6d}{\frac{9}{4}d} = \frac{\frac{45}{8}d - \frac{48}{8}d}{\frac{9}{4}d} = \frac{-\frac{3}{8}d}{\frac{9}{4}d} = -\frac{3}{8} \cdot \frac{4}{9} = -\frac{1}{6}$
 $\frac{5}{2} - \frac{6}{3} = \frac{15}{6} - \frac{12}{6} = \frac{3}{6} = \frac{1}{2}$

16. (A) by definition $|x| = x$ if $x \geq 0$
 $-x$ if $x < 0$
 I. $|x| - |y| = x - (-y) = x+y$
 II. $|x| - |y| = -x - y = -(x+y) \neq x+y$
 III. $|x| - |y| = x - y \neq x+y$

17. (E) $x+2y = -3$ $ax+3y = -2$; if \perp , $-\frac{a}{3} = 2$
 $\text{slope} = -\frac{1}{2}$ $\text{slope} = \frac{a}{3}$
 $-\frac{a}{3} = 2$
 $a = -6$

18. (B) not closed under add $= x^2 + (x+1)^2 = x^2 + x^2 + 2x + 1 = 2x^2 + 2x + 1$
 closed under mult. $= x^2(x+1)^2 = [x(x+1)]^2 = x^2(x+1)^2$
 not closed under div. $\frac{(x+1)^2}{x^2} = (\frac{x+1}{x})^2$ not necessarily an integer.

19. (B) $x+3 \leq -4$ OR $-2x \leq 14$
 $x \leq -7$ $x \geq -7$

 Q satisfies the inequality

20. (D) $\frac{1}{5}|x| = 10$
 $|x| = 50$ $-x = 50$ OR $-x = -50$
 $x = -50$ OR $x = 50$

21. (B) $x+2 = -2$
 $x+4 = 0$
 $x+6 = 2$
 $x+4 = x+2(x+6)$
 $x+4 = x+2x+12$
 $x+4 = 3x+12$
 $-2x = 8$
 $x = -4$

22. (B) $\frac{2}{x-3} - \frac{7x-3}{(x+6)(x-3)} = \frac{2(x+6) - 7x+3}{(x+6)(x-3)}$
 $\frac{-5x+15}{(x+6)(x-3)} = \frac{-5(x-3)}{(x+6)(x-3)} = \frac{-5}{x+6}$

23. (C) $\frac{(x+6)(x-3)}{x^3 x^{-5} y^4} = \left[\frac{x+6}{x^3} \cdot \frac{x-3}{x^{-5}} \cdot \frac{1}{y^4} \right]^3 = \left[x^{-2} \cdot x^2 \cdot y^{-4} \right]^3 = x^6 y^{-12} = \frac{x^6}{y^{12}}$

24. (C) $f(x) = 4^x$ $f(4) = 4^4$ $f(6) = 4^6$ $f(8) = 4^8$
 $\frac{4^4 \cdot 4^6}{4^8} = \frac{4^{10}}{4^8} = 4^2 = 16$

25. (D) $[(-1)^n]^2 = (-1)^{2n} = 1$ $1-1 = 0$
 $[(1)^n]^3 = (1)^{3n} = 1$

26. (B) Sum of perf. squares up to + including 5
 $1^2 + 2^2 + 3^2 + 4^2 + 5^2 = 55$

27. (D) $\frac{2(x+3)}{2(x+5)} \cdot \frac{2(x+5)}{(x+3)(x+5)} \cdot \frac{2(x+3)(x-2)}{2(x+5)}$

28. (E) \parallel to $x+y=11$ through $(1,4)$
 $x+y = 3$
 $-1+4 = 3$
 $x = 2y + k$ $2y = 5k - x$
 $2y = 5k - (2y+k) = 4k - 2y$
 $4y = 4k, y = k$
 $x = 3k$
 $x+y = 4k$

29. (D) $\frac{6x+y}{2x} = \frac{66}{4x}$
 $6x+y = 66$
 $2x \rightarrow 12k$
 $y = 3x+12$
 $6x+3x+12 = 66$
 $9x = 54$
 $x = 6$
 $\therefore \text{dist bet. cities} = 18+12 = 30$

30. (D) $\text{man's rate} = 2x$ $\text{Rhonda's rate} = x$
 $\text{dist} = 4x$ $\text{dist} = 2x$
 $6x+y = 66$
 $2x \rightarrow 12k$
 $y = 3x+12$
 $6x+3x+12 = 66$
 $9x = 54$
 $x = 6$
 $\therefore \text{dist bet. cities} = 18+12 = 30$