

Fast Run

ALG I TEAM SOLUTIONS 2-8-92

1. $1992^2 - 1991^2$
 $(1992+1991)(1992-1991)$
 $(3983)(1) = \boxed{3983}$

2. $8x+5y = 31$
 $3x+2y = 0$
 $14x+10y = 62$
 $15x+10y = 0$
 $31x = 62$
 $x = 2$
 $3(2) + 2y = 0$
 $6 + 2y = 0$
 $2y = -6$
 $y = -3$

3. $f(-5) = 0$
 $0 = -5m + b$
 $8 = 1m + b$
 $6 = -1m + b$
 $14 = 2m$
 $m = 7$
 $8 = 7 + b$
 $b = 1$
 $Y = 7x + 1$

4. $25Q + 10D = 325$
 $-10Q - 10D = -160$
 $15Q = 165$
 $Q = 11$

5. $\frac{12}{10} = \frac{q}{1}$
 $12 = 10q$
 $q = 1.2$

6. $2^2(2^1 - 2^0 + 2^{-1} - 2^{-2})$
 $4(2 - 1 + \frac{1}{2} - \frac{1}{4})$
 $4(2 - 1 + \frac{1}{2} - \frac{1}{4}) = \boxed{5}$

7. $f(x) = x^2$
 $g(x) = x-1$
 $f(g(x)) = (x-1)^2$
 $g(f(x)) = x^2 - 1$

8. $y = 4x + 5$
 $x = \frac{y-5}{4}$
 $15 + \frac{y-5}{4} = y$
 $60 + y - 5 = 4y$
 $55 = 3y$
 $y = 18\frac{1}{3}$

9. $x(x+1) < 12$
 $x^2 + x - 12 < 0$
 $(x+4)(x-3) < 0$
 $x < -4$ or $x > 3$

10. $2x^2 + 3x + 1 = \frac{2x+2}{x^2+1}$
 $2x^2 + 3x + 1 = \frac{2(x+1)}{x^2+1}$
 $(2x^2+1)(x+1) = 2(x+1)$
 $(2x^2+1) = 2$
 $2x^2 = 1$
 $x^2 = \frac{1}{2}$
 $x = \pm \frac{1}{\sqrt{2}}$

11. $A = 2x^2 + 11x + 5 = D$
 $B = x^2 - 14x - 32 = C$
 $A - B = 11x + 37$
 $11x + 37 = D - C$
 $11x + 37 = 2x^2 + 11x + 5 - (x^2 - 14x - 32)$
 $11x + 37 = 2x^2 + 11x + 5 - x^2 + 14x + 32$
 $11x + 37 = x^2 + 25x + 37$
 $0 = x^2 + 14x$
 $0 = x(x+14)$
 $x = 0$ or $x = -14$

12. $A = 3^4 - 2(3)^3 + (3)^2 - 8(3) - 10 = 2$
 $A = 81 - 54 + 9 - 24 - 10 = 2$
 $B = (-2)^3 + 3(-2)^2 + 2(-2) - 4 = -4$
 $B = -8 + 12 - 4 - 4 = -4$
 $5(2) - 3(-4) = 22$

13. $3y = 2x - 9$
 $y = \frac{2}{3}x - 3$
 $y = \frac{2}{3}x + b$
 $2 = \frac{2}{3}(6) + b$
 $2 = 4 + b$
 $-2 = b$
 $y = \frac{2}{3}x - 2$
 $2x - 3y = 6$

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14. $(6)(6)(6)(6) = (8)(8)(8)$
 $(8^2)(8^2)(8^2)(8^2) = 8^8$
 $2^3 \cdot 8 = 8^8$
 $8 = 8^7$
 $8 = 2^3$
 $8 = 2^3$

15. $(x+y)(x-y) = 20$
 $x-y = 8$
 $(x+y) \cdot 8 = 20$
 $x+y = \frac{20}{8}$
 $x+y = \frac{5}{2}$