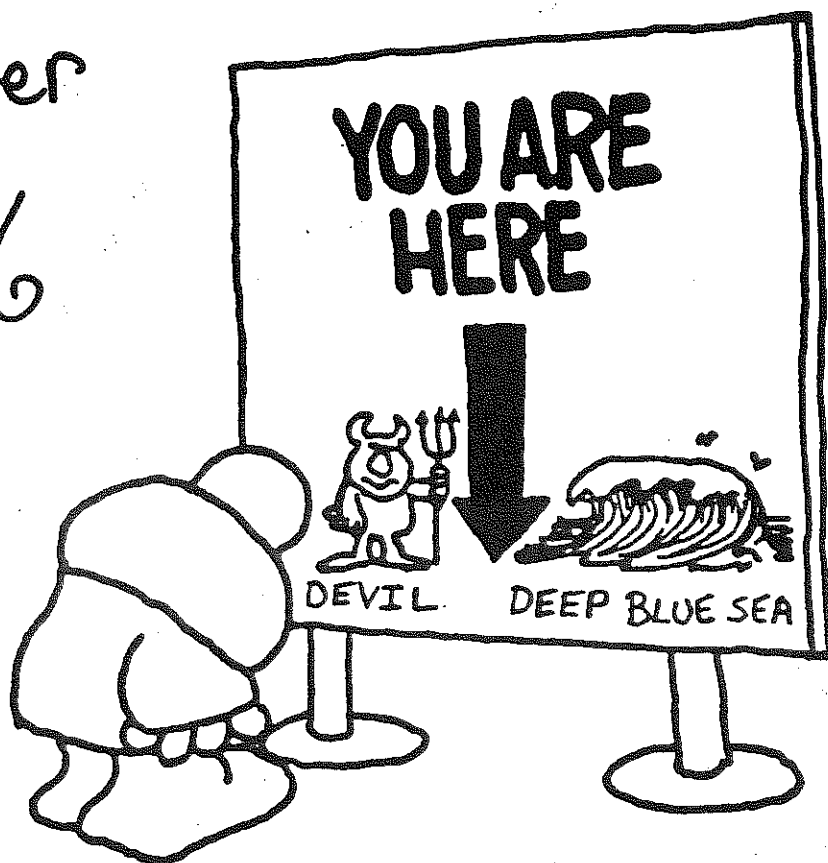


Friendship Junior High School Advanced Math Summer Program

Answer
Key



*Introduction To Algebra
Equations*

UNIT 2

Introduction To Algebra

1. INTEGER OPERATIONS

$$\textcircled{1} \begin{aligned} (+7) - (-5) \\ (+7) + (+5) = 12 \end{aligned}$$

$$\textcircled{2} (-3) + (-2) = -5$$

$$\textcircled{3} (+18) \div (-3) = -6$$

$$\textcircled{4} (-4) \times (-4) = 16$$

$$\textcircled{5} (-6) \cdot (+2) = -12$$

$$\textcircled{6} \begin{aligned} (-8) - (+7) \\ (-8) + (-7) = -15 \end{aligned}$$

$$\textcircled{7} \begin{aligned} (+3) - (-5) \\ (+3) + (+5) = 8 \end{aligned}$$

$$\textcircled{8} (-4) \div (+4) = -1$$

$$\textcircled{9} \begin{aligned} (-8) - (-5) \\ (-8) + (+5) = -3 \end{aligned}$$

$$\textcircled{10} (+9) \div (-3) = -3$$

$$\textcircled{11} \begin{aligned} (-12) - (-8) \\ (-12) + (+8) = -4 \end{aligned}$$

$$\textcircled{12} (-14) + (+9) = -5$$

$$\textcircled{13} (-17)(-1) = 17$$

$$\textcircled{14} (+3) \div (-3) = -1$$

$$\textcircled{15} \begin{aligned} (-2) - (+5) \\ (-2) + (-5) = -7 \end{aligned}$$

$$\textcircled{16} (-2)(-3)(-1) = -6$$

$$\textcircled{17} \begin{aligned} (-8) - (+5) \\ (-8) + (-5) = -13 \end{aligned}$$

$$\textcircled{18} (+4) \cdot (-7) = -28$$

$$\textcircled{19} \begin{aligned} (-3) - (-3) \\ (-3) + (+3) = 0 \end{aligned}$$

$$\textcircled{20} (-2) \times (-4) = 8$$

$$\textcircled{21} \begin{aligned} (-4) + (-7) + (+3) + (-7) - (+5) \\ (-4) + (-7) + (+3) + (-7) + (-5) \\ (+3) + (-23) = -20 \end{aligned}$$

$$\textcircled{22} \begin{aligned} (-2) - (+6) - (-5) + (+4) + (-2) \\ (-2) + (-6) + (+5) + (+4) + (-2) \\ (+9) + (-10) = -1 \end{aligned}$$

$$\textcircled{23} \begin{aligned} (-6) - (-8) + (-3) - (+4) - (-5) \\ (-6) + (+8) + (-3) + (-4) + (+5) \\ (+13) + (-13) = 0 \end{aligned}$$

$$\textcircled{24} \begin{aligned} (-5) + (-4) - (+3) + (+7) - (-12) \\ (-5) + (-4) + (-3) + (+7) + (+12) \\ (+19) + (-12) = 7 \end{aligned}$$

$$\textcircled{25} \begin{aligned} (-8) - (-4) - (-2) + (+7) + (-5) \\ (-8) + (+4) + (+2) + (+7) + (-5) \\ (+13) + (-13) = 0 \end{aligned}$$

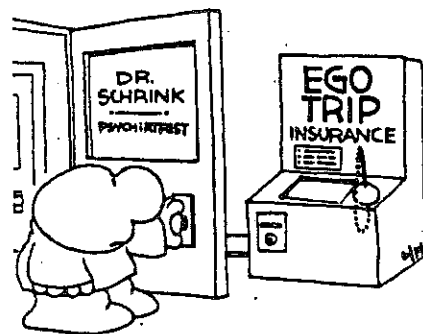
$$\textcircled{26} (-2)(-3)(+2)(-1)(+3) = -36$$

$$\textcircled{27} (-3)(+2)(+5)(-2)(+1) = 60$$

$$\textcircled{28} (-10) \div (-2)(-3) \div (-1)(-4) = -60$$

$$\textcircled{29} (-3)(+4) \div (-2) \div (-3)(-6) = 12$$

$$\textcircled{30} (+15) \div (-3)(+4) \div (-2) \div (-5) = -2$$



2. ORDER OF OPERATIONS

$$\textcircled{1} (-2)^2 = 4$$

$$\textcircled{2} (-3)^3 = -27$$

$$\textcircled{3} -2^2 = -4$$

$$\textcircled{4} -3^3 = -27$$

$$\textcircled{5} -5^0 = -1$$

$$\textcircled{6} (-7)^0 = 1$$

$$\textcircled{7} -4^3 = -64$$

$$\textcircled{8} -7^2 = -49$$

$$\textcircled{9} (-3)^4 = 81$$

$$\textcircled{10} (-5)^3 = -125$$

$$\textcircled{11} (-10)^3 = -1000$$

$$\textcircled{12} (-10)^4 = 10,000$$

UNIT 2

Introduction To Algebra

$$\textcircled{13} (-10)^5 = -100,000$$

$$\textcircled{14} -10^6 = -1,000,000$$

$$\textcircled{15} (-2)^5 = -32$$

$$\textcircled{16} (-8)^2 = 64$$

$$\textcircled{17} -8^2 = -64$$

$$\begin{aligned} \textcircled{18} (-3) + \boxed{(-4) \cdot (-2)} - (-3) \\ (-3) + (+8) - (-3) \\ (-3) + (+8) + (+3) \\ (+11) + (-3) = 8 \end{aligned}$$

$$\begin{aligned} \textcircled{19} \boxed{(-2)(-3)} - \boxed{(-4)(+5)} - (-4) \\ (+6) - (-20) - (-4) \\ (+6) + (+20) + (+4) = 30 \end{aligned}$$

$$\begin{aligned} \textcircled{20} (-2) + \boxed{(-6) \div (+2)} - (-4) \\ (-2) + (-3) - (-4) \\ (-2) + (-3) + (+4) \\ (+4) + (-5) = -1 \end{aligned}$$

$$\begin{aligned} \textcircled{21} \boxed{(+8) \div (-2)} - (-3) + \boxed{(-4)(-1)} \\ (-4) - (-3) + (+4) \\ (-4) + (+3) + (+4) \\ (+7) + (-4) = 3 \end{aligned}$$

$$\begin{aligned} \textcircled{22} (-3) - (+4) - \boxed{(-6) \cdot (-2) \cdot (-1)} \\ (-3) - (+4) - (-12) \\ (-3) + (-4) + (+12) \\ (+12) + (-7) = 5 \end{aligned}$$

$$\begin{aligned} \textcircled{23} \boxed{(-10) \div (+10)} + \boxed{(-3) \cdot (-2)} - (-4) \\ (-1) + (+6) - (-4) \\ (-1) + (+6) + (+4) = 9 \end{aligned}$$

$$\begin{aligned} \textcircled{24} (-2) - \boxed{(+5)(-3)} + \boxed{(-2) \div (-2)} \\ (-2) - (-15) + (+1) \\ (-2) + (+15) + (+1) \\ (+16) + (-2) = 14 \end{aligned}$$

$$\begin{aligned} \textcircled{25} \boxed{(-1)(-1)(-1) \div (-1)} - \boxed{(-1)(-1)} \\ (+1) - (+1) \\ (+1) + (-1) = 0 \end{aligned}$$

$$\textcircled{26} (-1)^3 = -1$$

$$\textcircled{30} -1^2 = -1$$

$$\textcircled{27} (-1)^4 = 1$$

$$\textcircled{31} (-1)^0 = 1$$

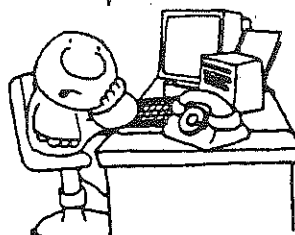
$$\textcircled{28} -1^5 = -1$$

$$\textcircled{32} -(-(-1)) = -1$$

$$\textcircled{29} -1^0 = -1$$

$$\textcircled{33} -[-(-(-1))] = 1$$

I'VE GOT E-MAIL, A FAX MACHINE, CALL WAITING AND CALL FORWARDING... NOW IF I JUST HAD SOMEBODY TO KEEP IN TOUCH WITH...



$$\begin{aligned} \textcircled{34} (-1)^2 - (-2)^3 - 2^2 - 2 \\ (+1) - (-8) - 4 - 2 \\ (+1) + (+8) + (-4) + (-2) \\ (+9) + (-6) = 3 \end{aligned}$$

$$\begin{aligned} \textcircled{35} (-2)^2 - 3^2 + (-4)^0 \\ (+4) - 9 + (+1) \\ (+4) + (-9) + (+1) \\ (+5) + (-9) = -4 \end{aligned}$$

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$$\begin{aligned} \textcircled{36} \quad & (-1)^3 + (-2)^2 - 1^4 + (-2)^3 \\ & (-1) + (+4) - 1 + (-8) \\ & (-1) + (+4) + (-1) + (-8) \\ & (+4) + (-10) = -6 \end{aligned}$$

$$\begin{aligned} \textcircled{37} \quad & (-3)^2 - (-5)^0 + (-7) - (-2)^4 \\ & (+9) - (+1) + (-7) - (+16) \\ & (+9) + (-1) + (-7) + (-16) \\ & (+9) + (-24) = -15 \end{aligned}$$

$$\begin{aligned} \textcircled{38} \quad & (-4) + (-2)^2 - (-1)^4 + (-2) \\ & (-4) + (+4) - (+1) + (-2) \\ & (-4) + (+4) + (-1) + (-2) \\ & (+4) + (-7) = -3 \end{aligned}$$

$$\begin{aligned} \textcircled{39} \quad & (-2)^3 - 2^3 - 3^2 + (-1)^6 \\ & (-8) - 8 - 9 + (+1) \\ & (-8) + (-8) + (-9) + (+1) \\ & (+1) + (-25) = -24 \end{aligned}$$

$$\begin{aligned} \textcircled{40} \quad & -[-(-(-2)^2)] \\ & -[-(-(+4))] = -4 \end{aligned}$$

$$\begin{aligned} \textcircled{41} \quad & -[-(-(-3))]^2 \\ & -[-3]^2 = -[+9] = -9 \end{aligned}$$

$$\textcircled{42} \quad \frac{(-3) - (-2)^0 + (-1)^2}{(-2) - (-1)^2}$$

$$\frac{(-3) - (+1) + (+1)}{(-2) - (+1)}$$

$$\frac{(-3) + (-1) + (+1)}{(-2) + (-1)} = \frac{-3}{-3} = 1$$

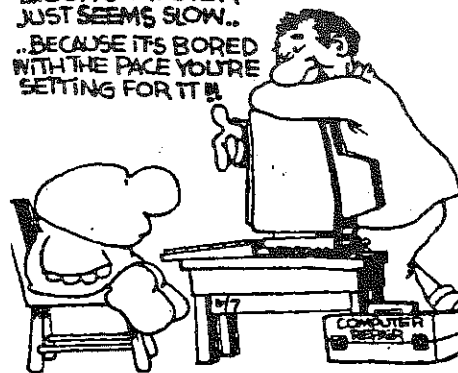
$$\textcircled{43} \quad \frac{(-2) - (-1)^3 - 2^3}{(-3)^2 - (-5) - 13} = \frac{(-2) - (-1) - 8}{(+9) - (-5) - 13}$$

$$\frac{(-2) + (+1) + (-8)}{(+9) + (+5) + (-13)} = \frac{-9}{1} = -9$$

$$\textcircled{44} \quad \frac{(-2)^2 - (-2)^3 + (-2)}{-10^2} = \frac{(+4) - (-8) + (-2)}{-100}$$

$$\frac{(+4) + (+8) + (-2)}{-100} = \frac{10}{-100} = -\frac{1}{10}$$

YOUR COMPUTER
JUST SEEMS SLOW..
..BECAUSE IT'S BORED
WITH THE PACE YOU'RE
SETTING FOR IT!!



EVALUATING EXPRESSIONS

$$\textcircled{1} \quad a + b \\ (-2) + (-1) = -3$$

$$\textcircled{3} \quad a b c \\ (-2)(-1)(3) = 6$$

$$\textcircled{2} \quad b - c \\ (-1) - (3) \\ (-1) + (-3) = -4$$

$$\textcircled{4} \quad ac - b \\ (-2)(3) - (-1) \\ (-6) + (+1) = -5$$

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$$\begin{aligned} \textcircled{5} \quad a + bc \\ (-2) + (-1)(3) \\ (-2) + (-3) = -5 \end{aligned}$$

$$\begin{aligned} \textcircled{6} \quad b - ab \\ (-1) - (-2)(-1) \\ (-1) - (+2) \\ (-1) + (-2) = -3 \end{aligned}$$

$$\begin{aligned} \textcircled{7} \quad 2x - y \\ 2(-1) - (-2) \\ (-2) - (-2) \\ (-2) + (-2) = -4 \end{aligned}$$

$$\begin{aligned} \textcircled{8} \quad xy - z \\ (-1)(2) - (-2) \\ (-2) - (-2) \\ (-2) + (+2) = 0 \end{aligned}$$

$$\begin{aligned} \textcircled{9} \quad 3x + 2y \\ 3(-1) + 2(2) \\ (-3) + (4) = 1 \end{aligned}$$

$$\begin{aligned} \textcircled{10} \quad 3xy - z \\ 3(-1)(2) - (-2) \\ (-6) - (-2) \\ (-6) + (+2) = -4 \end{aligned}$$

$$\begin{aligned} \textcircled{11} \quad -2xz - y \\ -2(-1)(-2) - (-2) \\ (-4) - (-2) \\ (-4) + (-2) = -6 \end{aligned}$$

$$\begin{aligned} \textcircled{12} \quad -3xyz \\ -3(-1)(2)(-2) = -12 \end{aligned}$$

$$\begin{aligned} \textcircled{13} \quad x^2 - 2y^2 \\ (-1)^2 - 2(2)^2 \\ (+1) - 2(4) \\ (+1) - (8) \\ (+1) + (-8) = -7 \end{aligned}$$

$$\begin{aligned} \textcircled{14} \quad 3x + z^3 \\ 3(-1) + (-2)^3 \\ 3(-1) + (-8) \\ (-3) + (-8) = -11 \end{aligned}$$

$$\begin{aligned} \textcircled{15} \quad 2x^2y \\ 2(-1)^2(2) \\ 2(1)(2) = 4 \end{aligned}$$

$$\begin{aligned} \textcircled{16} \quad xy - 3z^2 \\ (-1)(2) - 3(-2)^2 \\ (-1)(2) - 3(+4) \\ (-2) - (+12) \\ (-2) + (-12) = -14 \end{aligned}$$

$$\begin{aligned} \textcircled{17} \quad x^2y^2 - 3x^3 \\ (-1)^2(2)^2 - 3(-1)^3 \\ (+1)(+4) - 3(-1) \\ (+4) - (-3) \\ (+4) + (+3) = 7 \end{aligned}$$

$$\begin{aligned} \textcircled{18} \quad 3xy^2 - 2z \\ 3(-1)(2)^2 - 2(-2) \\ 3(-1)(4) - 2(-2) \\ (-12) - (-4) \\ (-12) + (+4) = -8 \end{aligned}$$

$$\textcircled{19} \quad -3^2 = -9$$

$$\textcircled{20} \quad (-3)^2 = 9$$

$$\textcircled{21} \quad -2^2 = -4$$

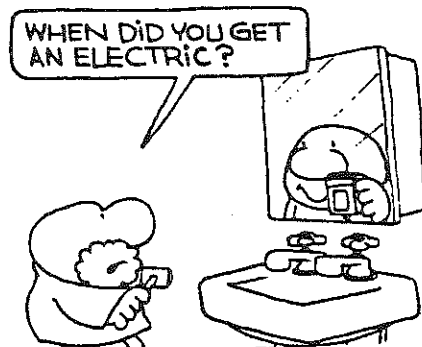
$$\textcircled{22} \quad (-2)^3 = -8$$

$$\textcircled{23} \quad -4^0 = -1$$

$$\textcircled{24} \quad (-4)^2 = 16$$

$$\begin{aligned} \textcircled{25} \quad (-3)^2 - (-1)(-4) + (-2)^3 \\ (+9) - \boxed{(-1)(-4)} + (-8) \\ (+9) - (+4) + (-8) \\ (+9) + (-4) + (-8) \\ (+9) + (-12) = -3 \end{aligned}$$

$$\begin{aligned} \textcircled{26} \quad (-2)^4 \div (-8) - (-1)^5 - 6^0 \\ \boxed{(+16) \div (-8)} - (-1) - 1 \\ (-2) - (-1) - 1 \\ (-2) + (+1) + (-1) \\ (+1) + (-3) = -2 \end{aligned}$$



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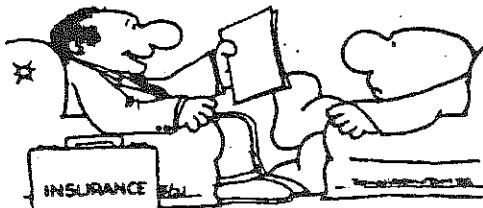
$$\begin{aligned} \textcircled{27} \quad & (-(-2)^2)^3 \\ & (-(+4))^3 \\ & (-4)^3 = -64 \end{aligned}$$

$$\textcircled{29} \quad -10^5 = -100,000$$

$$\textcircled{30} \quad (-10)^3 = -1000$$

$$\begin{aligned} \textcircled{28} \quad & -[-(-1)^2]^3 \\ & -[-(1)]^3 = -[-1]^3 = -(-1) = 1 \end{aligned}$$

NOW, THIS POLICY PROTECTS YOU AGAINST CON MEN POSING AS INSURANCE AGENTS...



$$\begin{aligned} \textcircled{6} \quad & 4a - 3b - a - 12 \\ & 3a - 3b - 12 \end{aligned}$$

$$\begin{aligned} \textcircled{7} \quad & 8a^2 + 3a - 5a^2 \\ & 3a^2 + 3a \end{aligned}$$

$$\begin{aligned} \textcircled{8} \quad & 4 - 6x + 2x^2 - 3x \\ & 4 - 9x + 2x^2 \end{aligned}$$

$$\begin{aligned} \textcircled{9} \quad & 8a - 2ab + 3b - 4ab \\ & 8a - 6ab + 3b \end{aligned}$$

$$\begin{aligned} \textcircled{10} \quad & 4xy - 2y + 3xy - 5y \\ & 7xy - 7y \end{aligned}$$

$$\begin{aligned} \textcircled{11} \quad & 2(3a + 3) - 1 \\ & 6a + 6 - 1 \\ & 6a + 5 \end{aligned}$$

$$\begin{aligned} \textcircled{12} \quad & 3n + 2(n - 3) \\ & 3n + 2n - 6 \\ & 5n - 6 \end{aligned}$$

$$\begin{aligned} \textcircled{13} \quad & 5(n - 1) + 2(2n - 2) \\ & 5n - 5 + 4n - 4 \\ & 9n - 9 \end{aligned}$$

$$\begin{aligned} \textcircled{14} \quad & 6n - 3(4n - 2) \\ & 6n - 12n + 6 \\ & -6n + 6 \end{aligned}$$

$$\begin{aligned} \textcircled{15} \quad & 5n - 2(3n + 4) - 2 \\ & 5n - 6n - 8 - 2 \\ & -n - 10 \end{aligned}$$

4. SIMPLIFYING EXPRESSIONS

$$\textcircled{1} \quad 2a + 3a + a = 6a$$

$$\begin{aligned} \textcircled{2} \quad & 3x + 5x - 12x \\ & 8x - 12x = -4x \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad & 4a + 7b - 2a - 3b \\ & 2a + 4b \end{aligned}$$

$$\begin{aligned} \textcircled{4} \quad & 5n - 3m - 7m + 4 \\ & 5n - 10m + 4 \end{aligned}$$

$$\begin{aligned} \textcircled{5} \quad & 6x - 2y + 7 - 3y - 9 \\ & 6x - 5y - 2 \end{aligned}$$

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$$\begin{aligned} \textcircled{16} \quad & 2x(x-4) + 3x^2 \\ & 2x^2 - 8x + 3x^2 \\ & 5x^2 - 8x \end{aligned}$$

$$\begin{aligned} & (-1)(+4) - (-2)(-3) \\ & (-4) - (+6) \\ & (-4) + (-6) = -10 \end{aligned}$$

$$\begin{aligned} \textcircled{17} \quad & x(x+y) - 2(x^2+1) \\ & x^2 + xy - 2x^2 - 2 \\ & -x^2 + xy - 2 \end{aligned}$$

$$\begin{aligned} \textcircled{24} \quad & (a+b) - (b+c) \\ & (-1) + (-2) - ((-2) + (-3)) \\ & (-3) - (-5) \\ & (-3) + (+5) = 2 \end{aligned}$$

$$\begin{aligned} \textcircled{18} \quad & 3a(a-2b) - a(2a+b) \\ & 3a^2 - 6ab - 2a^2 - ab \\ & a^2 - 7ab \end{aligned}$$

$$\begin{aligned} \textcircled{25} \quad & a^2 - b^3 - (a+c) \\ & (-1)^2 - (-2)^3 - ((-1) + (-3)) \\ & (+1) - (-8) - ((-1) + (-3)) \\ & (+1) - (-8) - (-4) \\ & (+1) + (+8) + (+4) = 13 \end{aligned}$$

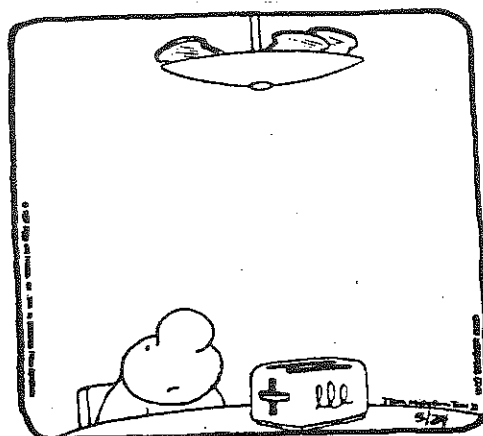
$$\begin{aligned} \textcircled{19} \quad & 2(x^2 - xy) - 3x(x-y) \\ & 2x^2 - 2xy - 3x^2 + 3xy \\ & -x^2 + xy \end{aligned}$$

$$\begin{aligned} \textcircled{20} \quad & 2ab - 3a(a+b) - a^2 \\ & 2ab - 3a^2 - 3ab - a^2 \\ & -ab - 4a^2 \end{aligned}$$

$$\begin{aligned} \textcircled{21} \quad & ab - 2b^2 \\ & (-1)(-2) - 2(-2)^2 \\ & (-1)(-2) - 2(4) \\ & (2) - (8) \\ & (2) + (-8) = -6 \end{aligned}$$

$$\begin{aligned} \textcircled{22} \quad & 3a^2b + c - b \\ & 3(-1)^2(-2) + (-3) - (-2) \\ & 3(+1)(-2) + (-3) - (-2) \\ & (-6) + (-3) + (+2) \\ & (+2) + (-9) = -7 \end{aligned}$$

$$\begin{aligned} \textcircled{23} \quad & ab^2 - bc \\ & (-1)(-2)^2 - (-2)(-3) \end{aligned}$$



$$\begin{aligned} \textcircled{26} \quad & 2a - bc^2 \\ & 2(-1) - (-2)(-3)^2 \\ & 2(-1) - (-2)(+9) \\ & (-2) - (-18) \\ & (-2) + (+18) = 16 \end{aligned}$$

$$\begin{aligned} \textcircled{27} \quad & a - b - c - ab \\ & (-1) - (-2) - (-3) - (-1)(-2) \\ & (-1) - (-2) - (-3) - (+2) \\ & (-1) + (+2) + (+3) + (-2) = 2 \end{aligned}$$

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$$\begin{aligned} 28 \quad & a^2 - a^3 - a^4 \\ & (-1)^2 - (-1)^3 - (-1)^4 \\ & (+1) - (-1) - (+1) \\ & (+1) + (+1) + (-1) \\ & (+2) + (-1) = 1 \end{aligned}$$

$$\begin{aligned} 29 \quad & 2ab - 3bc \\ & 2(-1)(-2) - 3(-2)(-3) \\ & (+4) - (+18) \\ & (+4) + (-18) = -14 \end{aligned}$$

$$\begin{aligned} 30 \quad & a^3b^2 + abc \\ & (-1)^3(-2)^2 + (-1)(-2)(-3) \\ & (-1)(+4) + (-1)(-2)(-3) \\ & (-4) + (-6) = -10 \end{aligned}$$

$$\begin{aligned} 31 \quad & -2^2 - (-3)(-2) + (-2)^2 \\ & -4 - \boxed{(-3)(-2)} + (+4) \\ & -4 - (+6) + (+4) \\ & -4 + (-6) + (+4) \\ & (+4) + (-10) = -6 \end{aligned}$$

$$\begin{aligned} 32 \quad & (-3)(-6) \div (-2) - (-1)^3 - (-2) \\ & \boxed{(-3)(-6) \div (-2)} - (-1) - (-2) \\ & (-9) - (-1) - (-2) \\ & (-9) + (+1) + (+2) \\ & (+3) + (-9) = -6 \end{aligned}$$

$$\begin{aligned} 33 \quad & (-2)(+4) - (-6) \div (-2) - 3^0 \\ & \boxed{(-2)(+4)} - \boxed{(-6) \div (-2)} - 1 \\ & (-8) - (+3) - 1 \\ & (-8) + (-3) + (-1) = -12 \end{aligned}$$

$$\begin{aligned} 34 \quad & (-8) - \boxed{(-4) \div (-2)} - \boxed{(-1)(-2)(-3)} \\ & (-8) - (+2) - (-6) \\ & (-8) + (-2) + (+6) = -4 \end{aligned}$$

...JUST WHEN I
FINALLY BEGIN TO
ACCEPT THAT LIFE'S
PASSED ME BY...
..IT LAPS ME AGAIN!!



5. REVIEW & PRACTICE

$$\textcircled{1} \quad \begin{aligned} (-3) - (-4) \\ (-3) + (+4) = 1 \end{aligned}$$

$$\textcircled{6} \quad (-2)(-3)(-2) = -12$$

$$\textcircled{2} \quad (-8) \div (+4) = -2$$

$$\textcircled{7} \quad \begin{aligned} (-9) - (-5) \\ (-9) + (+5) = -4 \end{aligned}$$

$$\textcircled{3} \quad (+6) + (-8) = -2$$

$$\textcircled{8} \quad (+12) + (-8) = 4$$

$$\textcircled{4} \quad (-10) \cdot (-3) = 30$$

$$\textcircled{9} \quad (-16) \div (-2) = 8$$

$$\textcircled{5} \quad \begin{aligned} (-1) - (+7) \\ (-1) + (-7) = -8 \end{aligned}$$

$$\textcircled{10} \quad \begin{aligned} (-7) - (+4) \\ (-7) + (-4) = -11 \end{aligned}$$

$$\textcircled{11} \quad \begin{aligned} (-3) + (-4) - (-2) + (+7) - (+4) \\ (-3) + (-4) + (+2) + (+7) + (-4) \\ (+9) + (-11) = -2 \end{aligned}$$

$$\textcircled{12} \quad \begin{aligned} (+7) + (-3) - (-5) - (+7) + (-2) \\ (+7) + (-3) + (+5) + (-7) + (-2) \\ (+12) + (-12) = 0 \end{aligned}$$

$$\textcircled{13} \quad -3^2 = -9$$

$$\textcircled{15} \quad -6^0 = -1$$

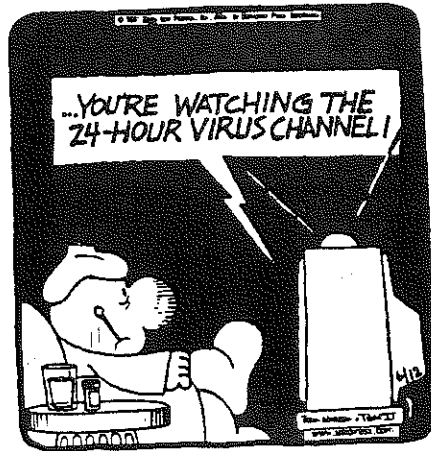
$$\textcircled{14} \quad (-4)^2 = 16$$

$$\textcircled{16} \quad -1^3 = -1$$

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(17) $(-2)^3 = -8$ (21) $(+10)^2 = +100$
 (18) $(-2)^4 = 16$ (22) $5^3 = 125$
 (19) $-2^2 = -4$ (23) $7^2 = 49$
 (20) $-10^3 = -1000$ (24) $-2^5 = -32$



(25) $(-3) - [(-2)(-4)] + (-2)$
 $(-3) - (+8) + (-2)$
 $(-3) + (-8) + (-2) = -13$

(26) $[(-8) \div (-4)] - [(-10) \div (+2)]$
 $(+2) - (-5)$
 $(+2) + (+5) = 7$

(27) $-3^2 - (-2)^3 + (-1)^5$
 $-9 - (-8) + (-1)$
 $-9 + (+8) + (-1)$
 $(+8) + (-10) = -2$

(28) $-4 - (-2)^2 - (-8)^0$
 $-4 - (+4) - (+1)$
 $-4 + (-4) + (-1) = -9$

(29) $(-1)(-2)(-1)^4 - (-12)$
 $[(-1)(-2)(+1)] - (-12)$
 $(+2) + (+12) = 14$

(30) $(-3) \div (-1)^0 - (-2)^3 - 2^3$
 $[(-3) \div (+1)] - (-8) - 8$
 $(-3) - (-8) - 8$
 $(-3) + (+8) + (-8)$
 $(+8) + (-11) = -3$

(31) $2a - b$
 $2(-2) - (-3)$
 $(-4) - (-3)$
 $(-4) + (+3) = -1$

(32) $3a - (b + c)$
 $3(-2) - ((-3) + (-1))$
 $3(-2) - (-4)$
 $(-6) - (-4)$
 $(-6) + (+4) = -2$

(33) $2a^2 - bc^3$
 $2(-2)^2 - (-3)(-1)^3$
 $2(+4) - (-3)(-1)$
 $(+8) - (+3)$
 $(+8) + (-3) = 5$

(34) $2a - abc$
 $2(-2) - (-2)(-3)(-1)$
 $(-4) - (-6)$
 $(-4) + (+6) = 2$

UNIT 2

Introduction To Algebra

$$\begin{aligned} 35) \quad & a - bc^2 - bc^3 \\ & (-2) - (-3)(-1)^2 - (-3)(-1)^3 \\ & (-2) - \boxed{(-3)(+1)} - \boxed{(-3)(-1)} \\ & (-2) - (-3) - (+3) \\ & (-2) + (+3) + (-3) \\ & (+3) + (-5) = -2 \end{aligned}$$

$$\begin{aligned} 36) \quad & 2(a+b) - 2c \\ & 2((-2) + (-3)) - 2(-1) \\ & 2(-5) - 2(-1) \\ & (-10) - (-2) \\ & (-10) + (+2) = -8 \end{aligned}$$

$$\begin{aligned} 37) \quad & a^2 + b^2 - c^2 \\ & (-2)^2 + (-3)^2 - (-1)^2 \\ & (+4) + (+9) - (+1) \\ & (+4) + (+9) + (-1) \\ & (+13) + (-1) = 12 \end{aligned}$$

$$\begin{aligned} 38) \quad & a + 2b + 3c \\ & (-2) + 2(-3) + 3(-1) \\ & (-2) + (-6) + (-3) = -11 \end{aligned}$$

$$\begin{aligned} 39) \quad & abc^2 - a^2c^4 \\ & (-2)(-3)(-1)^2 - (-2)^2(-1)^4 \\ & (-2)(-3)(+1) - (+4)(+1) \\ & (+6) - (+4) \\ & (+6) + (-4) = 2 \end{aligned}$$

$$\begin{aligned} 40) \quad & a^2 - 3(a+b+c) \\ & (-2)^2 - 3((-2) + (-3) + (-1)) \\ & (-2)^2 - 3(-6) \\ & (+4) - (-18) \\ & (+4) + (+18) = 22 \end{aligned}$$

$$\begin{aligned} 41) \quad & 2a - 3(a+2b) - 3b \\ & 2a - 3a - 6b - 3b \\ & -a - 9b \end{aligned}$$

$$\begin{aligned} 42) \quad & 4(a+2b) - 2(3a-b) \\ & 4a + 8b - 6a + 2b \\ & -2a + 10b \end{aligned}$$

$$\begin{aligned} 43) \quad & x(x+2) - 3x(x+4) \\ & x^2 + 2x - 3x^2 - 12x \\ & -2x^2 - 10x \end{aligned}$$

$$\begin{aligned} 44) \quad & x(2x-y) - y(x+2) \\ & 2x^2 - xy - xy - 2y \\ & 2x^2 - 2xy - 2y \end{aligned}$$

$$\begin{aligned} 45) \quad & ab - a(b+2a) - 3a^2 \\ & ab - ab - 2a^2 - 3a^2 \\ & -5a^2 \end{aligned}$$

$$\begin{aligned} 46) \quad & 2x - 3x^2 - 2x + 4x^2 - 1 \\ & x^2 - 1 \end{aligned}$$

$$\begin{aligned} 47) \quad & 3a - 2ab - a + 4ab + 2a \\ & 4a + 2ab \end{aligned}$$

$$\begin{aligned} 48) \quad & 2xy - 3x^2 - 2x(y-3x) \\ & 2xy - 3x^2 - 2xy + 6x^2 \\ & 3x^2 \end{aligned}$$

$$\begin{aligned} 49) \quad & 2b^2 - 3ab - b(a-b) \\ & 2b^2 - 3ab - ab + b^2 \\ & 3b^2 - 4ab \end{aligned}$$

$$\begin{aligned} 50) \quad & a - ab - a(2a+b) + a^2 \\ & a - ab - 2a^2 - ab + a^2 \\ & a - 2ab - a^2 \end{aligned}$$

Introduction To Algebra

Extra Practice Problems - Solution Guide

$$\begin{aligned} \textcircled{1} & (-3)^0 + (-2)(-3)^2 + (-1) \\ & (+1) + (-2)(+9) + (-1) \\ & (+1) + (-18) + (-1) \\ & -18 \end{aligned}$$

$$\begin{aligned} & a^2 - bc \\ & (-2)^2 - (-1)(2) \\ & (+4) - (-1)(2) \\ & (+4) - (-2) \\ & (+4) + (+2) \\ & 6 \end{aligned}$$

$$\begin{aligned} & x^2 + 3x - 2x^2 + 6x - 3 \\ & -x^2 + 9x - 3 \end{aligned}$$

$$\begin{aligned} \textcircled{2} & -4^2 - (-2)^3 + (-1)^2 \\ & -16 - (-8) + (+1) \\ & -16 - (-8) \\ & -16 + (+8) \\ & -8 \end{aligned}$$

$$\begin{aligned} & 3a + 4c^3 \\ & 3(-2) + 4(2)^3 \\ & 3(-2) + 4(8) \\ & (-6) + (32) \\ & 26 \end{aligned}$$

$$\begin{aligned} & 4b - 2(a-b) - 3a + b \\ & 4b - 2a + 2b - 3a + b \\ & 7b - 5a \end{aligned}$$

$$\begin{aligned} \textcircled{3} & -[-(-3)^2] + (-4)^2 \\ & -[-(+9)] + (+16) \\ & (+9) + (+16) \\ & 25 \end{aligned}$$

$$\begin{aligned} & 2ab^2 + 3c \\ & 2(-2)(-1)^2 + 3(2) \\ & 2(-2)(+1) + 3(2) \\ & (-4) + (6) \\ & 2 \end{aligned}$$

$$\begin{aligned} & 2a(a-b) - 3b(2a+b) \\ & 2a^2 - 2ab - 6ab - 3b^2 \\ & 2a^2 - 8ab - 3b^2 \end{aligned}$$

$$\begin{aligned} \textcircled{4} & (-2)(-1)^3 - (-3)^2(-2) \\ & (-2)(-1) - (+9)(-2) \\ & (+2) - (-18) \\ & (+2) + (+18) \\ & 20 \end{aligned}$$

$$\begin{aligned} & 2a^2b - 4bc \\ & 2(-2)^2(-1) - 4(-1)(2) \\ & 2(+4)(-1) - 4(-1)(2) \\ & (-8) - (-8) \\ & (-8) + (+8) \\ & 0 \end{aligned}$$

$$\begin{aligned} & 4n^2 - 2n(n-1) - 6n \\ & 4n^2 - 2n^2 + 2n - 6n \\ & 2n^2 - 4n \end{aligned}$$

$$\begin{aligned} \textcircled{5} & -4^2 - 2^3 - (-2)^2 \\ & -16 - 8 - (+4) \\ & -16 + (-8) + (-4) \\ & -28 \end{aligned}$$

$$\begin{aligned} & 3(a+b) \\ & 3(-2) + (-1) \\ & 3(-3) \\ & -9 \end{aligned}$$

$$\begin{aligned} & 2ab + 3a - 4ab - 5 - a \\ & -2ab + 2a - 5 \end{aligned}$$

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$$\begin{aligned} \textcircled{6} & (-4)^2 - (-1)(-2)^3 - (-2) \\ & (+16) - (-1)(-8) - (-2) \\ & (+16) - (+8) - (-2) \\ & (+16) + (-8) + (+2) \\ & 10 \end{aligned}$$

$$\begin{aligned} & 2b - 2(b+c) \\ & 2(-1) - 2((-1)+(2)) \\ & 2(-1) - 2(1) \\ & (-2) - (2) \\ & (-2) + (-2) \\ & -4 \end{aligned}$$

$$\begin{aligned} & 3n - 4(n-m) - 3m + n \\ & 3n - 4n + 4m - 3m + n \\ & m \end{aligned}$$

$$\begin{aligned} \textcircled{7} & -3^3 + (-1)^4(-5) \\ & -27 + (+1)(-5) \\ & -27 + (-5) \\ & -32 \end{aligned}$$

$$\begin{aligned} & 3abc - b^2 \\ & 3(-2)(-1)(2) - (-1)^2 \\ & 3(-2)(-1)(2) - (+1) \\ & (+12) - (+1) \\ & (+12) + (-1) \\ & 11 \end{aligned}$$

$$\begin{aligned} & -5x(y-2x) - 3y(x-2y) \\ & -5xy + 10x^2 - 3xy + 6y^2 \\ & -8xy + 10x^2 + 6y^2 \end{aligned}$$

$$\begin{aligned} \textcircled{8} & -(-3)^2 - (-(-2)^2) \\ & -(+9) - (-(+4)) \\ & (-9) - (-4) \\ & (-9) + (+4) \\ & -5 \end{aligned}$$

$$\begin{aligned} & a^2 b^2 c^2 \\ & (-2)^2 (-1)^2 (2)^2 \\ & (+4)(+1)(+4) \\ & 16 \end{aligned}$$

$$\begin{aligned} & 2a^2 - 3a(a+2b) - 5ab \\ & 2a^2 - 3a^2 - 6ab - 5ab \\ & -a^2 - 11ab \end{aligned}$$

$$\begin{aligned} \textcircled{9} & (-1)^4(-3)^2 - 3^2 \cdot (-1) \\ & (+1)(+9) - 9 \cdot (-1) \\ & (+9) - (-9) \\ & (+9) + (+9) \\ & 18 \end{aligned}$$

$$\begin{aligned} & -3(a+b)^2 \\ & -3((-2)+(-1))^2 \\ & -3(-3)^2 \\ & -3(+9) \\ & -27 \end{aligned}$$

$$\begin{aligned} & 6x - 2(3x-5) - 1 \\ & 6x - 6x + 10 - 1 \\ & 9 \end{aligned}$$

$$\begin{aligned} \textcircled{10} & -(-2)^2 - 3^3 + (-4)^0 \\ & -(+4) - 27 + (+1) \\ & (-4) + (-27) + (+1) \\ & -30 \end{aligned}$$

$$\begin{aligned} & -2a(b+c)^2 \\ & -2(-2)((-1)+(2))^2 \\ & -2(-2)(1)^2 \\ & -2(-2)(1) \\ & 4 \end{aligned}$$

$$\begin{aligned} & x(3-y) + 2xy - 3x(y+1) \\ & 3x - xy + 2xy - 3xy - 3x \\ & -2xy \end{aligned}$$

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$$\begin{aligned} \textcircled{11} & (-3)^2 + (-2)(-2)^2 + (-1) \\ & (+9) + (-2)(+4) + (-1) \\ & (+9) + (-8) + (-1) \\ & 0 \end{aligned}$$

$$\begin{aligned} & ab^2 - c^2b \\ & (-2)(-1)^2 - (2)^2(-1) \\ & (-2)(+1) - (+4)(-1) \\ & (-2) - (-4) \\ & (-2) + (+4) \\ & 2 \end{aligned}$$

$$\begin{aligned} & 2a^2 - 5 - 4a^2 - 3a - 1 \\ & -2a^2 - 6 - 3a \end{aligned}$$

$$\begin{aligned} \textcircled{12} & -2^2 - (-2)^3 \cdot (-3) \\ & -4 - (-8) \cdot (-3) \\ & -4 - (+24) \\ & -4 + (-24) \\ & -28 \end{aligned}$$

$$\begin{aligned} & 2b - 5ac \\ & 2(-1) - 5(-2)(2) \\ & (-2) - (-20) \\ & (-2) + (+20) \\ & 18 \end{aligned}$$

$$\begin{aligned} & 2x - 3(x - 2y) - y - 4x \\ & 2x - 3x + 6y - y - 4x \\ & -5x + 5y \end{aligned}$$

$$\begin{aligned} \textcircled{13} & -[-(-2)]^2 - (-(-3)) \\ & -[+2]^2 - (+3) \\ & -(+4) - (+3) \\ & (-4) + (-3) \\ & -7 \end{aligned}$$

$$\begin{aligned} & 3ac^2 + 2b^3 \\ & 3(-2)(2)^2 + 2(-1)^3 \\ & 3(-2)(+4) + 2(-1) \\ & (-24) + (-2) \\ & -26 \end{aligned}$$

$$\begin{aligned} & 3n(2n-1) - 4n(3-n) \\ & 6n^2 - 3n - 12n + 4n^2 \\ & 10n^2 - 15n \end{aligned}$$

$$\begin{aligned} \textcircled{14} & (-3)^3(-4)^0 - 5^2 \cdot (-1) \\ & (-27)(+1) - 25 \cdot (-1) \\ & (-27) - (-25) \\ & (-27) + (+25) \\ & -2 \end{aligned}$$

$$\begin{aligned} & 4a(a+b) \\ & 4(-2)((-2)+(-1)) \\ & 4(-2)(-3) \\ & 24 \end{aligned}$$

$$\begin{aligned} & 3x^2 - 4x(2x-y) - 3xy \\ & 3x^2 - 8x^2 + 4xy - 3xy \\ & -5x^2 + xy \end{aligned}$$

$$\begin{aligned} \textcircled{15} & -6^2 - (-7)^0 + (-3)^2 \\ & -36 - (+1) + (+9) \\ & -36 + (-1) + (+9) \\ & -28 \end{aligned}$$

$$\begin{aligned} & -2c(b+c)^3 \\ & -2(2)((+1)+(2))^3 \\ & -2(2)(1)^3 \\ & -2(2)(1) \\ & -4 \end{aligned}$$

$$\begin{aligned} & 2y - 3x(2y+4) - xy \\ & 2y - 6xy - 12x - xy \\ & 2y - 7xy - 12x \end{aligned}$$

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$$\begin{aligned} \textcircled{16} & (-5)^0 - (-3)(-1)^5 - (-2) \\ & (+1) - (-3(-1)) - (-2) \\ & (+1) - (+3) - (-2) \\ & (+1) + (-3) + (+2) \\ & 0 \end{aligned}$$

$$\begin{aligned} & -2a^3b^0 \\ & -2(-2)^3(-1)^0 \\ & -2(-8)(+1) \\ & 16 \end{aligned}$$

$$\begin{aligned} & 8x(y-3) + 2y(5-3x) \\ & 8xy - 24x + 10y - 6xy \\ & 2xy - 24x + 10y \end{aligned}$$

$$\begin{aligned} \textcircled{17} & -5^2 + (-3)^2(-2) \\ & -25 + (+9)(-2) \\ & -25 + (-18) \\ & -43 \end{aligned}$$

$$\begin{aligned} & 4b^3c - ab \\ & 4(-1)^3(2) - (-2)(-1) \\ & 4(-1)(2) - (-2)(-1) \\ & (-8) - (+2) \\ & (-8) + (-2) \\ & -10 \end{aligned}$$

$$\begin{aligned} & 2y(3-5x) - y(2y-x) \\ & 6y - 10xy - 2y^2 + xy \\ & 6y - 9xy - 2y^2 \end{aligned}$$

$$\begin{aligned} \textcircled{18} & -[-(-2)^3] - (-(-4)) \\ & -[-(-8)] - (-(-4)) \\ & -[+8] - (+4) \\ & (-8) + (-4) \\ & -12 \end{aligned}$$

$$\begin{aligned} & 3a^2b^4 - c^2 \\ & 3(-2)^2(-1)^4 - (2)^2 \\ & 3(+4)(+1) - (+4) \\ & (+12) - (+4) \\ & (+12) + (-4) \\ & 8 \end{aligned}$$

$$\begin{aligned} & 5x(2x-y) - y(3-2x) \\ & 10x^2 - 5xy - 3y + 2xy \\ & 10x^2 - 3xy - 3y \end{aligned}$$

$$\begin{aligned} \textcircled{19} & (-2)^3 \cdot (-2) - 2^3 \cdot (-2) \\ & (-8) \cdot (-2) - 8 \cdot (-2) \\ & (+16) - (-16) \\ & (+16) + (+16) \\ & 32 \end{aligned}$$

$$\begin{aligned} & 2abc - b^2c \\ & 2(-2)(-1)(2) - (-1)^2(2) \\ & 2(-2)(+1)(2) - (+1)(2) \\ & (+8) - (+2) \\ & (+8) + (-2) \\ & 6 \end{aligned}$$

$$\begin{aligned} & 7ab + 2(3-2ab) - 2 \\ & 7ab + 6 - 4ab - 2 \\ & 3ab + 4 \end{aligned}$$

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$$\begin{aligned} \textcircled{20} & -(-3)^2 + (-4)^2 - (-20) \\ & -(+9) + (+16) - (-20) \\ & (-9) + (+16) + (+20) \\ & 27 \end{aligned}$$

$$\begin{aligned} & 3(a+b)^2 \\ & 3(-2+(-1))^2 \\ & 3(-3)^2 \\ & 3(+9) \\ & 27 \end{aligned}$$

$$\begin{aligned} & 2x - 3(4x - 2) - 5 \\ & 2x - 12x + 6 - 5 \\ & -10x + 1 \end{aligned}$$

UNIT 3

Equations

1. BASIC EQUATIONS

$$\textcircled{1} \quad x - 7^{+7} = -20^{+7}$$

$$x = -13$$

$$\textcircled{2} \quad 5^{+15} = a - 15^{+15}$$

$$20 = a$$

$$a = 20$$

$$\textcircled{3} \quad 14^{-14} - n = -9^{-14}$$

$$-n = -23$$

$$n = 23$$

$$\textcircled{4} \quad 8^{-8} - n = 12^{-8}$$

$$-n = 4$$

$$n = -4$$

$$\textcircled{5} \quad 2x = 22$$

$$\left(\frac{1}{2}\right)(2x) = \left(\frac{1}{2}\right)(22)$$

$$x = \frac{22}{2} = 11$$

$$\textcircled{6} \quad 18 = -3x$$

$$\left(-\frac{1}{3}\right)(18) = \left(-\frac{1}{3}\right)(-3x)$$

$$-\frac{18}{3} = x$$

$$x = \frac{-18}{3} = -6$$

$$\textcircled{7} \quad 3x + 2^{-2} = 11^{-2}$$

$$3x = 9$$

$$\left(\frac{1}{3}\right)(3x) = \left(\frac{1}{3}\right)(9)$$

$$x = \frac{9}{3} = 3$$

$$\textcircled{8} \quad 4a + 5^{-5} = -15^{-5}$$

$$4a = -20$$

$$\left(\frac{1}{4}\right)(4a) = \left(\frac{1}{4}\right)(-20)$$

$$a = \frac{-20}{4} = -5$$

$$\textcircled{9} \quad \frac{2n}{3} - 1^{+1} = 3^{+1}$$

$$\frac{2n}{3} = 4$$

$$\left(\frac{3}{2}\right)\left(\frac{2n}{3}\right) = \left(\frac{3}{2}\right)(4)$$

$$n = \frac{12}{2} = 6$$

$$\textcircled{10} \quad \frac{-3x}{4} - 3^{+3} = -9^{+3}$$

$$\frac{-3x}{4} = -6$$

$$\left(-\frac{4}{3}\right)\left(\frac{-3x}{4}\right) = \left(-\frac{4}{3}\right)(-6)$$

$$x = \frac{24}{3} = 8$$

$$\textcircled{11} \quad -11^{-4} = 4^{-4} - \frac{3a}{2}$$

$$-15 = \frac{-3a}{2}$$

$$\left(-\frac{2}{3}\right)(-15) = \left(-\frac{2}{3}\right)\left(\frac{-3a}{2}\right)$$

$$\frac{30}{3} = a$$

$$a = \frac{30}{3} = 10$$

$$\textcircled{12} \quad 3x - 4 + 7x = 18 - x$$

$$10x - 4 = 18 - x$$

$$11x - 4 = 18$$

$$11x = 22$$

$$\left(\frac{1}{11}\right)(11x) = \left(\frac{1}{11}\right)(22)$$

$$x = \frac{22}{11} = 2$$



$$\textcircled{13} \quad 4a - 6 = 2a - 4 + 4a$$

$$4a - 6 = 6a - 4$$

$$-2a - 6 = -4$$

continued

UNIT 3

Equations

$$-2a - 6^{+6} = -4^{+6}$$

$$-2a = 2$$

$$\left(\frac{1}{2}\right)(-2a) = \left(\frac{1}{2}\right)(2)$$

$$a = \frac{-2}{2} = -1$$

$$\textcircled{14} \quad 2x - 3 + 7 = x + 6 - 2$$

$$2x + 4 = x + 4$$

$$x + 4 = 4$$

$$x = 0$$

$$\textcircled{15} \quad 5n = 3n - 4n + 12$$

$$5n = -n + 12$$

$$6n = 12$$

$$\left(\frac{1}{6}\right)(6n) = \left(\frac{1}{6}\right)(12)$$

$$n = \frac{12}{6} = 2$$

$$\textcircled{2} \quad 4 + 3(4 + 2n) = 10$$

$$4 + 12 + 6n = 10$$

$$16 + 6n = 10$$

$$6n = -6$$

$$\left(\frac{1}{6}\right)(6n) = \left(\frac{1}{6}\right)(-6)$$

$$n = \frac{-6}{6} = -1$$

$$\textcircled{3} \quad 8x - 2(3x + 2) = 0$$

$$8x - 6x - 4 = 0$$

$$2x - 4 = 0$$

$$2x = 4$$

$$\left(\frac{1}{2}\right)(2x) = \left(\frac{1}{2}\right)(4)$$

$$x = \frac{4}{2} = 2$$

$$\textcircled{4} \quad 6(3 - 2x) - 2(x + 2) = -14$$

$$18 - 12x - 2x - 4 = -14$$

$$14 - 14x = -14$$

$$-14x = -28$$

$$\left(\frac{-1}{14}\right)(-14x) = \left(\frac{-1}{14}\right)(-28)$$

$$x = \frac{28}{14} = 2$$

2. COMPLEX EQUATIONS

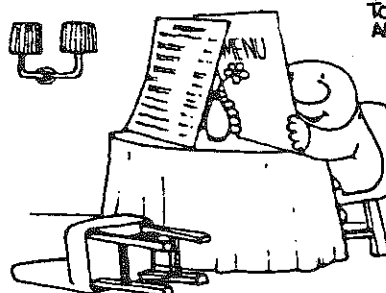
$$\textcircled{1} \quad 2(x + 1) = 16$$

$$2x + 2 = 16$$

$$2x = 14$$

$$\left(\frac{1}{2}\right)(2x) = \left(\frac{1}{2}\right)(14)$$

$$x = \frac{14}{2} = 7$$



...YOU KNOW, DEBBIE ...
IT MAY SURPRISE YOU
TO DISCOVER THAT YOU
ARE MY FIRST BLIND
DATE IN YEARS!

UNIT 3

Equations

$$\begin{aligned} \textcircled{5} \quad 3(n+4) &= 2(n-1) - 2 \\ 3n + 12 &= 2n - 2 - 2 \\ 3n + 12 &= 2n - 4 \\ n + 12 &= -4 \\ n &= -16 \end{aligned}$$

$$\begin{aligned} \textcircled{6} \quad 3x - 3 &= 5 - 2(x+4) \\ 3x - 3 &= 5 - 2x - 8 \\ 3x - 3 &= -3 - 2x \\ 5x - 3 &= -3 \\ 5x &= 0 \\ \left(\frac{1}{5}\right)(5x) &= \left(\frac{1}{5}\right)(0) \\ x &= 0 \end{aligned}$$

$$\begin{aligned} \textcircled{7} \quad 6(a+2) - 3(3a+1) &= 0 \\ 6a + 12 - 9a - 3 &= 0 \\ -3a + 9 &= 0 \\ -3a &= -9 \\ \left(-\frac{1}{3}\right)(-3a) &= \left(-\frac{1}{3}\right)(-9) \\ a &= \frac{9}{3} = 3 \end{aligned}$$

$$\begin{aligned} \textcircled{8} \quad 4n - \frac{2n}{3} &= -10 \\ 3\left(4n - \frac{2n}{3}\right) &= 3(-10) \end{aligned}$$

$$\begin{aligned} 12n - 2n &= -30 \\ 10n &= -30 \\ \left(\frac{1}{10}\right)(10n) &= \left(\frac{1}{10}\right)(-30) \\ n &= \frac{-30}{10} = -3 \end{aligned}$$

$$\begin{aligned} \textcircled{9} \quad 5 + 2x &= \frac{3x}{4} \\ 4\left(5 + 2x\right) &= 4\left(\frac{3x}{4}\right) \\ 20 + 8x &= 3x \\ 20 &= -5x \\ \left(-\frac{1}{5}\right)(20) &= \left(-\frac{1}{5}\right)(-5x) \\ \frac{-20}{5} &= x \\ x &= \frac{-20}{5} = -4 \end{aligned}$$

$$\begin{aligned} \textcircled{10} \quad 4(n-2) &= \frac{4n}{3} \\ 4n - 8 &= \frac{4n}{3} \\ 3(4n - 8) &= 3\left(\frac{4n}{3}\right) \\ 12n - 24 &= 4n \\ -24 &= -8n \\ \left(-\frac{1}{8}\right)(-24) &= \left(-\frac{1}{8}\right)(-8n) \\ \frac{24}{8} &= n \\ n &= \frac{24}{8} = 3 \end{aligned}$$

UNIT 3

Equations

$$\textcircled{1} \quad \frac{3x}{2} - x = 2(x-3)$$

$$\frac{3x}{2} - x = 2x - 6$$

$$2 \left(\frac{3x}{2} - x = 2x - 6 \right)$$

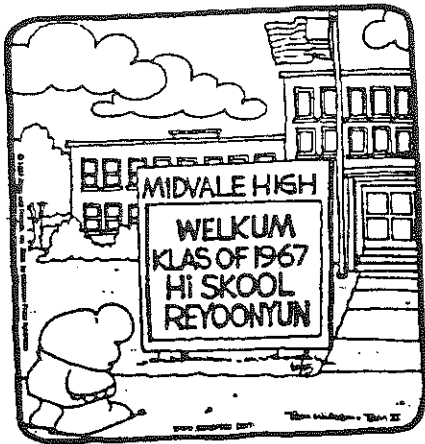
$$3x - 2x = 4x - 12$$

$$\begin{array}{r} -4x \quad -4x \\ x = 4x - 12 \end{array}$$

$$-3x = -12$$

$$\left(-\frac{1}{3}\right)(-3x) = \left(-\frac{1}{3}\right)(-12)$$

$$x = \frac{12}{3} = 4$$



3. CONSECUTIVE INTEGERS

$$\textcircled{1} \quad \begin{array}{l} x \\ x+1 \\ x+2 \end{array}$$

$$(x) + (x+1) + (x+2) = 87$$

$$3x + 3 = 87$$

$$3x = 84$$

$$\left(\frac{1}{3}\right)(3x) = \left(\frac{1}{3}\right)(84)$$

$$x = \frac{84}{3} = 28$$

$$\begin{array}{l} x = 28 \\ x+1 = 29 \\ x+2 = 30 \end{array}$$

$$\textcircled{2} \quad \begin{array}{l} x = 31 \\ x+1 = 32 \\ x+2 = 33 \\ x+3 = 34 \end{array}$$

$$(x) + (x+1) + (x+2) + (x+3) = 130$$

$$4x + 6 = 130$$

$$4x = 124$$

$$\left(\frac{1}{4}\right)(4x) = \left(\frac{1}{4}\right)(124)$$

$$x = \frac{124}{4} = 31$$

$$\textcircled{3} \quad \begin{array}{l} x = 31 \\ x+2 = 33 \end{array}$$

$$(x) + (x+2) = 64$$

$$2x + 2 = 64$$

$$2x = 62$$

$$\left(\frac{1}{2}\right)(2x) = \left(\frac{1}{2}\right)(62)$$

$$x = \frac{62}{2} = 31$$

UNIT 3

Equations

$$\begin{aligned} \textcircled{4} \quad x &= \boxed{22} \\ x+2 &= \boxed{24} \\ x+4 &= \boxed{26} \end{aligned}$$

$$(x) + (x+2) + (x+4) = 72$$

$$3x + 6 = 72$$

$$3x = 66$$

$$\left(\frac{1}{3}\right)(3x) = \left(\frac{1}{3}\right)(66)$$

$$x = \frac{66}{3} = 22$$

$$2a + 15 = -1$$

$$2a = -16$$

$$\left(\frac{1}{2}\right)(2a) = \left(\frac{1}{2}\right)(-16)$$

$$a = \frac{-16}{2} = -8$$

$$\textcircled{8} \quad 6 - 2(n-3) = 12$$

$$6 - 2n + 6 = 12$$

$$12 - 2n = 12$$

$$-2n = 0$$

$$\left(-\frac{1}{2}\right)(-2n) = \left(-\frac{1}{2}\right)(0)$$

$$n = 0$$

$$\begin{aligned} \textcircled{5} \quad x &= -7 \\ x+2 &= \boxed{-5} \\ x+4 &= -3 \end{aligned}$$

$$(x) + (x+2) + (x+4) = -15$$

$$3x + 6 = -15$$

$$3x = -21$$

$$\left(\frac{1}{3}\right)(3x) = \left(\frac{1}{3}\right)(-21)$$

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

$$\textcircled{9} \quad 4a - \frac{3a}{2} = 5$$

$$2\left(4a - \frac{3a}{2}\right) = 2(5)$$

$$8a - 3a = 10$$

$$5a = 10$$

$$\left(\frac{1}{5}\right)(5a) = \left(\frac{1}{5}\right)(10)$$

$$a = \frac{10}{5} = 2$$

$$\textcircled{6} \quad 4(3n-2) = -20$$

$$12n - 8 = -20$$

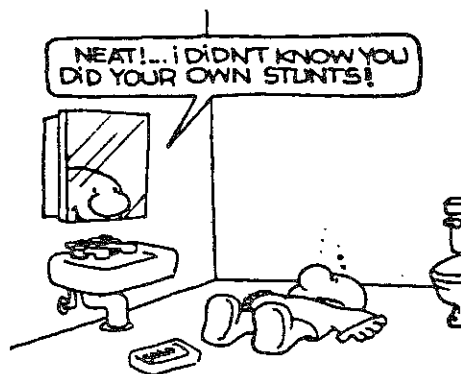
$$12n = -12$$

$$\left(\frac{1}{12}\right)(12n) = \left(\frac{1}{12}\right)(-12)$$

$$n = \frac{-12}{12} = -1$$

$$\textcircled{7} \quad 3(2a+5) = 4a-1$$

$$6a + 15 = 4a - 1$$



UNIT 3

Equations

$$\textcircled{10} \quad 2n + \frac{5n}{3} = -11$$

$$3 \left(2n + \frac{5n}{3} = -11 \right)$$

$$6n + 5n = -33$$

$$11n = -33$$

$$\left(\frac{1}{11}\right)(11n) = \left(\frac{1}{11}\right)(-33)$$

$$n = \frac{-33}{11} = -3$$

$$\textcircled{11} \quad 2x - 3(x-1) = \frac{2x}{3} - 2$$

$$2x - 3x + 3 = \frac{2x}{3} - 2$$

$$-x + 3 = \frac{2x}{3} - 2$$

$$3(-x + 3 = \frac{2x}{3} - 2)$$

$$-3x + 9 = 2x - 6$$

$$-5x + 9 = -6$$

$$-5x = -15$$

$$\left(\frac{-1}{5}\right)(-5x) = \left(\frac{-1}{5}\right)(-15)$$

$$x = \frac{15}{5} = 3$$

$$\textcircled{12} \quad n - 3(n-4) = \frac{n}{2} - 3$$

$$n - 3n + 12 = \frac{n}{2} - 3$$

$$-2n + 12 = \frac{n}{2} - 3$$

$$2(-2n + 12 = \frac{n}{2} - 3)$$

$$-4n + 24 = n - 6$$

$$-5n + 24 = -6$$

$$-5n = -30$$

$$\left(\frac{-1}{5}\right)(-5n) = \left(\frac{-1}{5}\right)(-30)$$

$$n = \frac{30}{5} = 6$$



4. PROBLEM SOLVING

$$\textcircled{1} \quad \begin{array}{l} x = 10 \\ x+2 = 12 \\ x+4 = \boxed{14} \end{array}$$

$$3x = 2(x+4) + 2$$

$$3x = 2x + 8 + 2$$

$$3x = 2x + 10$$

$$x = 10$$

$$\textcircled{2} \quad \begin{array}{l} x \\ x+2 \\ x+4 \end{array} \quad \text{(continued)}$$

UNIT 3

Equations

$$2(x+4) = x+7$$

$$\overset{-x}{2x+8} = \overset{-x}{x+7}$$

$$x+8 = 7$$

$$x = -1$$

$$x = -1$$

$$x+2 = \boxed{-1}$$

$$x+4 = 3$$

$$\textcircled{3} \quad x = 5$$

$$x+1 = 6$$

$$x+2 = \boxed{7}$$

$$3(x+1) = 4(x+2) - 10$$

$$3x+3 = 4x+8-10$$

$$\overset{-4x}{3x+3} = \overset{-4x}{4x-2}$$

$$-x+3 = -2$$

$$-x = -5$$

$$x = 5$$

$$\textcircled{4} \quad x = 2$$

$$x+1 = \boxed{3}$$

$$x+2 = 4$$

$$2(x+1) - 3x = (x+2) - 4$$

$$2x+2-3x = x+2-4$$

$$\overset{-x}{-x+2} = \overset{-x}{x-2}$$

$$-2x+2 = -2$$

$$-2x = -4$$

$$\left(-\frac{1}{2}\right)(-2x) = \left(-\frac{1}{2}\right)(-4) \quad x=2$$

$$\textcircled{5} \quad 4n + 7 = 39$$

$$4n = 32$$

$$\left(\frac{1}{4}\right)(4n) = \left(\frac{1}{4}\right)(32)$$

$$n = \frac{32}{4} = 8$$

$$\textcircled{6} \quad 2n - 3 = 4n - 11$$

$$\overset{+3}{-2n-3} = \overset{+3}{-11}$$

$$-2n = -8$$

$$\left(-\frac{1}{2}\right)(-2n) = \left(-\frac{1}{2}\right)(-8)$$

$$n = \frac{8}{2} = 4$$

you must use parenthesis

$$\textcircled{7} \quad 2n - (n+2) = -5$$

$$2n - n - 2 = -5$$

$$n - 2 = -5$$

$$n = -3$$

$$\textcircled{8} \quad n + 11 = 3n - 7$$

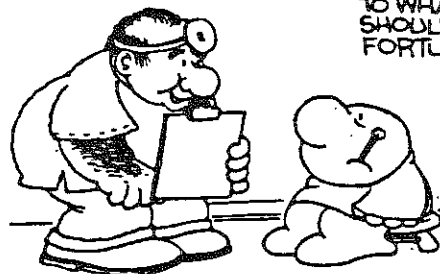
$$\overset{-11}{-2n+11} = \overset{-11}{-7}$$

$$-2n = -18$$

$$\left(-\frac{1}{2}\right)(-2n) = \left(-\frac{1}{2}\right)(-18)$$

$$n = \frac{18}{2} = 9$$

...FORGET ABOUT THE BILL. THE MOVIE RIGHTS TO WHAT YOU'VE GOT SHOULD BE WORTH A FORTUNE!!



UNIT 3

Equations

$$\begin{aligned} \textcircled{9} \quad 3n - (2n - 2) &= -2 \\ 3n - 2n + 2 &= -2 \\ n + 2 &= -2 \\ n &= -4 \end{aligned}$$

parenthesis
needed

$$\begin{aligned} \textcircled{10} \quad (2n + 4) - (n - 3) &= 2n + 9 \\ 2n + 4 - n + 3 &= 2n + 9 \\ n + 7 &= 2n + 9 \\ -n + 7 &= 9 \\ -n &= 2 \\ n &= -2 \end{aligned}$$

5. REVIEW & PRACTICE

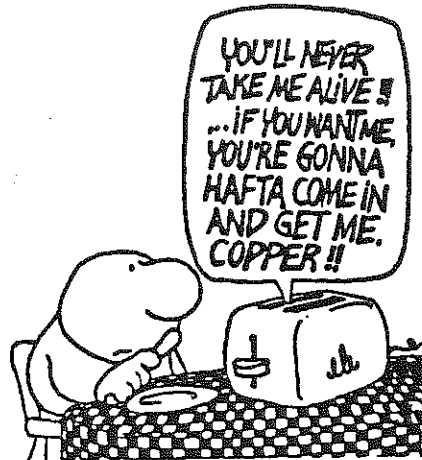
$$\begin{aligned} \textcircled{1} \quad 4n &= -28 \\ \left(\frac{1}{4}\right)(4n) &= \left(\frac{1}{4}\right)(-28) \\ n &= \frac{-28}{4} = -7 \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad \frac{3x}{4} &= 9 \\ \left(\frac{4}{3}\right)\left(\frac{3x}{4}\right) &= \left(\frac{4}{3}\right)(9) \\ x &= \frac{36}{3} = 12 \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad 5a - 3 &= -13 \\ 5a &= -10 \\ \left(\frac{1}{5}\right)(5a) &= \left(\frac{1}{5}\right)(-10) \\ a &= \frac{-10}{5} = -2 \end{aligned}$$

$$\begin{aligned} \textcircled{4} \quad 3n - 5 + n &= 2 - 4n + 1 \\ 4n - 5 &= 3 - 4n \\ 8n - 5 &= 3 \\ 8n &= 8 \\ \left(\frac{1}{8}\right)(8n) &= \left(\frac{1}{8}\right)(8) \\ n &= \frac{8}{8} = 1 \end{aligned}$$

$$\begin{aligned} \textcircled{5} \quad 11 - 2x - 3 + 4x &= 7 - x - 8 \\ 8 + 2x &= -1 - x \\ 8 + 3x &= -1 \\ 3x &= -9 \\ \left(\frac{1}{3}\right)(3x) &= \left(\frac{1}{3}\right)(-9) \\ x &= \frac{-9}{3} = -3 \end{aligned}$$



$$\begin{aligned} \textcircled{6} \quad \frac{2n}{3} - n &= n - 12 \\ 3\left(\frac{2n}{3} - n\right) &= 3(n - 12) \end{aligned}$$

UNIT 3

Equations

$$2n - 3n = 3n - 36$$

$$\overset{-3n}{-n} = \overset{-3n}{3n} - 36$$

$$-4n = -36$$

$$\left(-\frac{1}{4}\right)(-4n) = \left(-\frac{1}{4}\right)(-36)$$

$$n = \frac{36}{4} = 9$$

$$\textcircled{7} \quad 4 - \frac{n}{2} = 3n - 10$$

$$2\left(4 - \frac{n}{2} = 3n - 10\right)$$

$$8 - \overset{-6n}{n} = \overset{-6n}{6n} - 20$$

$$\overset{-8}{8} - 7n = -20 \overset{-8}{-8}$$

$$-7n = -28$$

$$\left(-\frac{1}{7}\right)(-7n) = \left(-\frac{1}{7}\right)(-28)$$

$$n = \frac{28}{7} = 4$$

$$\textcircled{8} \quad 2(3x - 1) = 7x + 1$$

$$\overset{-7x}{6x} - 2 = \overset{-7x}{7x} + 1$$

$$-x - 2 \overset{+2}{+2} = 1 \overset{+2}{+2}$$

$$-x = 3$$

$$x = -3$$

$$\textcircled{9} \quad 7 - 2(2x - 2) = 10 - 3x$$

$$7 - 4x + 4 = 10 - 3x$$

$$11 - 4x \overset{+3x}{+3x} = 10 - 3x \overset{+3x}{+3x}$$

$$11 \overset{-11}{-11} - x = 10 \overset{-11}{-11}$$

$$-x = -1$$

$$x = 1$$

$$\textcircled{10} \quad 2(n - 3) - 3(2n - 1) = -23$$

$$2n - 6 - 6n + 3 = -23$$

$$-4n - 3 \overset{+3}{+3} = -23 \overset{+3}{+3}$$

$$-4n = -20$$

$$\left(-\frac{1}{4}\right)(-4n) = \left(-\frac{1}{4}\right)(-20)$$

$$n = \frac{20}{4} = 5$$

$$\textcircled{11} \quad 2(x + 6) = \frac{x}{2}$$

$$2x + 12 = \frac{x}{2}$$

$$2\left(2x + 12 = \frac{x}{2}\right)$$

$$\overset{-4x}{4x} + 24 = x \overset{-4x}{-4x}$$

$$24 = -3x$$

$$\left(-\frac{1}{3}\right)(24) = \left(-\frac{1}{3}\right)(-3x)$$

$$\overset{-24}{-24} = x$$

$$x = \frac{-24}{3} = -8$$

Continued

UNIT 3

Equations

$$\textcircled{12} \quad 4(n+5) = \frac{2n}{3}$$

$$4n+20 = \frac{2n}{3}$$

$$3(4n+20) = \frac{2n}{3} \cdot 3$$

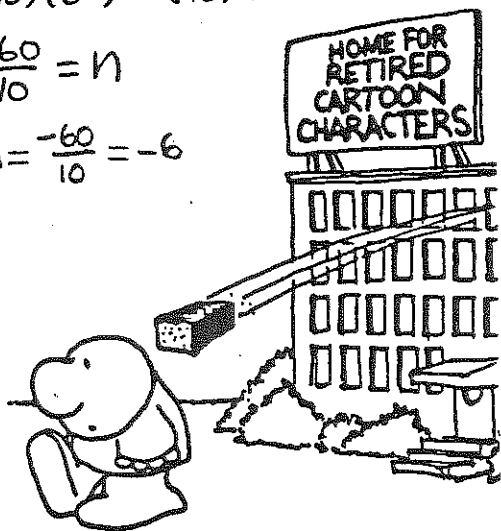
$$12n+60 = 2n$$

$$60 = -10n$$

$$\left(\frac{-1}{10}\right)(60) = \left(\frac{-1}{10}\right)(-10n)$$

$$\frac{-60}{10} = n$$

$$n = \frac{-60}{10} = -6$$



$$\textcircled{13} \quad \begin{array}{l} x = 5 \\ x+1 = 6 \\ x+2 = 7 \end{array}$$

$$(x) + (x+1) + (x+2) = 18$$

$$3x + 3 = 18$$

$$3x = 15$$

$$\left(\frac{1}{3}\right)(3x) = \left(\frac{1}{3}\right)(15)$$

$$x = \frac{15}{3} = 5$$

$$\textcircled{14} \quad \begin{array}{l} x = 4 \\ x+2 = 6 \\ x+4 = 8 \end{array}$$

$$x+4 = 2(x+2) - 4$$

$$x+4 = 2x+4-4$$

$$x+4 = 2x$$

$$4 = x$$

$$\textcircled{15} \quad \begin{array}{l} x = -7 \\ x+2 = -5 \\ x+4 = -3 \end{array}$$

$$2(x+2) = 3(x+4) - 1$$

$$2x+4 = 3x+12-1$$

$$2x+4 = 3x+11$$

$$-x+4 = 11$$

$$-x = 7$$

$$x = -7$$

$$\textcircled{16} \quad \begin{array}{l} x = 9 \\ x+1 = 10 \\ x+2 = 11 \end{array}$$

parenthesis needed

$$4x - (x+2) = 2(x+1) + 5$$

$$4x - x - 2 = 2x + 2 + 5$$

$$3x - 2 = 2x + 7$$

$$x - 2 = 7$$

$$x = 9$$

UNIT 3

Equations

⑰ $x = 11$
 $x + 2 = 13$
 $x + 4 = 15$ ← parenthesis needed

$3x - 2(x + 4) = 3$
 $3x - 2x - 8 = 3$
 $x - 8 = 3 + 8$
 $x = 11$

⑱ $2n - 4 = 10$
 $2n = 14$
 $(\frac{1}{2})(2n) = (\frac{1}{2})(14)$
 $n = \frac{14}{2} = 7$

⑲ $3n - (n + 2) = 10$ ← parenthesis needed
 $3n - n - 2 = 10$
 $2n - 2 = 10 + 2$
 $2n = 12$
 $(\frac{1}{2})(2n) = (\frac{1}{2})(12)$
 $n = \frac{12}{2} = 6$

⑳ $(2n + 2) - (n - 3) = 1$
 $2n + 2 - n + 3 = 1$
 $n + 5 = 1 - 5$
 $n = -4$ ← parenthesis needed

㉑ $3n - 4 = 2n + 5$
 $n - 4 = 5 + 4$
 $n = 9$

㉒ $4n - (n + 7) = 2n - 2$
 $4n - n - 7 = 2n - 2$
 $3n - 7 = 2n - 2$
 $n - 7 = -2 + 7$
 $n = 5$ ← parenthesis needed

