PRACTICE CUMULATIVE EVALUATION A2 FOR INTEGRATED ALGEBRA 2 – FORM 1

Lesson 6.1 (Exponents) & Lesson 5.1-2 (Solving Linear Systems by Algebra) + Review of Subunit A1

Ground Rules for Test Completion

1. Present your work in a neat and organized manner. Use <u>complete sentences</u> whenever you are asked to make a statement.

2. SHOW YOUR WORK: Partial credit will be awarded on the basis of the work shown.

3. Make sure you answer ALL parts of problems.

⇐ ♦ ⇒

Review and Extension Questions for Subunit A1:

1. [15] (1) Solve each of the equations below by **isolating the variable**. (2) If there is a **unique solution**, **show a check of your solution.** If there is **NO solution**, or the solution is **ALL REAL Numbers**, **explain your conclusion**. **NOTE: No credit will be awarded unless work is shown.**

    a. Solve for z: $(^3/_4)(z + 4) = (^1/_3)(2z) + 2$

    b. Solve for j: $4(-7 - 6j) = 33 - 24j$

    c. Solve for t: $-2[(^7/_9)t + 3] = ^8/_3 - 4t$

2. [3] The formula for the volume of a cylinder is $V = \pi r^2 h$, where r is the radius of the base and h is the height of the cylinder. Solve this formula for h.

3. [15] (1) Solve each of the inequalities below **algebraically**. (2) Graph each **solution set** on a number line – **be sure to label all critical points. NOTE: No credit will be awarded unless work is shown.**

    a. Solve for r: $15 \geq 25 - 2r$

    b. Solve for a: $11a + 22 < -33$

    c. Solve for z: $49 \geq 14 + 7y \geq -7$

4. [2] In the coming year, Kennebec Valley Widgets expects to make a profit of at least $50,000 but less than $85,000. Write a compound inequality which represents their expected profit, p.

Questions for Subunit A2:

5. [8] Rewrite each expression below. Leave your answer in exponential form.

    a. $5^6 \bullet a^4 \bullet 5^2 \bullet a$
                                                 b. $m^4 \bullet n^9 \bullet m^7 \bullet n \bullet m^3$

    c. $11^5 \bullet 11^{29} \bullet 11^{37}$
                                                d. $9 \bullet 9 \bullet 9 \bullet 9 \bullet 9 \bullet q \bullet q \bullet q$

6. [8] Rewrite each expression below in simplest form using exponents.

    a. $(z^3)^{11}$
                    b. $k^{25} \div k^{13}$
                    c. $(4h)^3$
                    d. $c^5 \bullet c^7$

7. [16] Simplify each expression below.

    a. $5(a^9 b^9)^2 - 3(a^3 b^3)^6$
        b. $\left(\dfrac{5b^3 \bullet 5b^4)^3}{5^{16} \bullet b^{11}} \right)^2$
        c. $\dfrac{p^6 q^{10}}{q^7 p^{13}}$
        d. $(5a^2 b^3)^2$

(Continued on next page)

Created 2009 by R. E. Buzby, Sidney, ME

8. [6] Calculate the value of each expression below.

   a. $4g^0 + (3h)^0$

   b. $$\frac{(5b^0)^2 - 5}{4c^0}$$

9. [6] Use the **substitution** method to solve this system. **Show a check of your solution. NOTE: No credit will be awarded unless work is shown.**

   $a = 2b - 7$
   $3a + 5b = 23$

10. [6] Use the **elimination** method to solve this system. **Show a check of your solution. NOTE: No credit will be awarded unless work is shown.**

    $5x + y = 18$
    $3x - y = -42$

11. [7] Use **either substitution or elimination** to solve this system. **Show a check of your solution. NOTE: No credit will be awarded unless work is shown.**

    $6x + 2y = -30$
    $3x - 5y = 63$

12. [7] Use the **either substitution or elimination** to solve this system. **Show a check of your solution. NOTE: No credit will be awarded unless work is shown.**

    $y - 4x = 17$
    $3x + 5y = 16$

ANSWER KEY with SOLUTIONS TO SELECTED PROBLEMS

1a. $(^3/_4)z + 3 = (^2/_3)z + 2$ → $12[(^3/_4)z + 3] = [(^2/_3)z + 2]12$ → $9z + 36 = 8z + 24$ → $\mathbf{z = -12}$
  Check: $(^3/_4)([-12] + 4) = (^1/_3)(2[-12]) + 2$ → $(^3/_4)(-8) = (^1/_3)(-24) + 2$ → $-6 = -6$ √

1b. $-28 - 24j = 33 - 24j$ → $-28 - 24j \underline{+ 24j} = 33 - 24j \underline{+ 24j}$ → $-28 = 33$; **No solution**

1c. $-2[(^7/_9)t + 3] = {^8/_3} - 4t$ → $(^{-14}/_9)t + -6 = {^8/_3} - 4t$ → $9[(^{-14}/_9)t + -6] = [{^8/_3} - 4t]9$ →
  $-14t + -54 = 24 - 36t$ → $22t = 78$ → $\mathbf{t = {^{39}/_{11}}}$
  Check: $-2[(^7/_9)[{^{39}/_{11}}] + 3] = {^8/_3} - 4[{^{39}/_{11}}]$ → $-2[{^{273}/_{99}} + {^{297}/_{99}}] = {^8/_3} - {^{156}/_{11}}$ → ${^{-380}/_{33}} = {^{-380}/_{33}}$ √

2. $\mathbf{h = {}^V\!/_{(\pi r2)}}$

3a. $25 - 2r \le 15$ → $-2r \le -10$ → $\mathbf{r \ge 5}$ → ;

3b. $11a < -55$ → $\mathbf{a < -5}$;

3c. $35 \ge 7y \ge -21$ → $\mathbf{5 \ge y \ge -3}$ or $\mathbf{-3 \le y \le 5}$

4. $\mathbf{50{,}000 \le p < 85{,}000}$

5a. $\mathbf{5^8 \cdot a^5}$ 5b. $\mathbf{m^{14} \cdot n^{10}}$ 5c. $\mathbf{11^{71}}$ 5d. $\mathbf{9^5\, q^3}$

6a. $\mathbf{z^{33}}$ 6b. $\mathbf{k^{12}}$ 6c. $\mathbf{4^3 h^3}$ 6d. $\mathbf{c^{12}}$

7a. $5a^{18}b^{18} - 3a^{18}b^{18} = \mathbf{2^{18}b^{18}}$

7b. $[\dfrac{(5^2 b^7)^3}{5^{16} b^{11}}]^2$ → $[\dfrac{5^6 b^{21}}{5^{16} b^{11}}]^2$ → $[\dfrac{b^{10}}{5^{10}}]^2$ → $\dfrac{b^{20}}{5^{20}}$

7c. $\dfrac{q^3}{p^7}$

7d. $\mathbf{5^2 a^4 b^6}$ or $\mathbf{25 a^4 b^6}$

8a. $4 + 1 = \mathbf{5}$

8b. $\dfrac{5^2 - 5}{4} = \dfrac{20}{4} = \mathbf{5}$

9. $3(2b - 7) + 5b = 23$ → $11b - 21 = 23$ → $11b = 44$ → $\mathbf{b = 4}$
  $a = 2(4) - 7$ → $\mathbf{a = 1}$
  Check: $1 = 2(4) - 7$ → $1 = 1$ √ & $3(1) + 5(4) = 23$ → $23 = 23$ √

(Continued on next page)

ANSWER KEY with SOLUTIONS TO SELECTED PROBLEMS –(Continued)

10.
```
5x + y =  18
3x − y = −42
8x      = −24
```
→ **x = −3**

$5(-3) + y = 18$ → **y = 33**

```
Ck: 5(-3) + 33 = 18 → 18 = 18 √
    3(-3) − 33 = −42 → −42 = −42 √
```

11.
```
    6x + 2y  = −30
−2[3x − 5y] = [63](−2)
```

```
6x +  2y  =  −30
−6x + 10y  = −126
       12y  = −156
```
→ **y = −13**

```
6x + 2(−13) = −30
          6x = −4
```
→ **x = $-\frac{2}{3}$**

Ck: $6(-\frac{2}{3}) + 2(-13) = -30$ → $-4 + -26 = -30$ → $-30 = -30$ √

Ck: $3(-\frac{2}{3}) - 5(-13) = 63$ → $-2 - (65) = 63$ → $63 = 63$ √

12. $y - 4x = 17$ → $y = 4x + 17$

$3x + 5(4x + 17) = 9$ → $23x + 85 = 16$ → $23x = -69$ → **x = –3**

$y = 4(-3) + 17$ → **y = 5**

Check: $5 - 4(-3) = 17$ → $17 = 17$ √

$3(-3) + 5(5) = 16$ → $16 = 16$ √