MAT.0650 - Elementary Algebra

Test 2 Review (Sep, 25)

- Materials: Chapter 2, 3, 4.
- Lecture notes are always part of the review materials, please do not start the problems until you are already familiar with the materials in lecture notes.
- Test Date: Tuesday, 10/15. (This is a Tuesday following a Monday schedule.)
- Test Time:
  - The test starts at the **beginning** of class.
  - The test is 40 minutes long. No extended or extra time will be given for lateness.
- No Calculator is allowed.
- This review sheet may NOT contain actual problems from the test.
- The actual test does NOT contain as many problems as this worksheet does.

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1. Evaluate. Simplify if possible.
   (a) $(-5x^3y)^2$
   (b) $-2x(-3x)^2(-y)$
   (c) $7x(3x-4)$
   (d) $2y^3(y^2-5y+4)$
   (e) $-5r^2s(3r^2-4s-9)$
   (f) $\dfrac{8y^5-4y^3}{2y^2}$
   (g) $\dfrac{12m^3-15m^2+3m}{-3m}$
   (h) $\dfrac{21r^2s-14r^2s^3+(-28r^3s^2)}{-7r^2s}$
   (i) $8r(rs^2)+3rs(rs)-r^2s^2$
   (j) $7q-(4q-q)$
   (k) $(a^2b+4b)+(2ab^2-3b)$
   (l) $(7x^2+2x-3)-(x^2+2x-1)$
   (m) $5x-3(2x-7)+9$
   (n) $2x^2(x-6)-x(3x+5)-11$
   (o) $(2x-7)(-x-3)$
   (p) $(y-7)^2$
   (q) $(2y+5)(3y+4)$
   (r) $(2m-7)(2m+7)$
   (s) $(x+2)(x^2-2x+3)$
   (t) $(2x+3)(x^2-x-2)$
   (u) $(x-4)(3x^2+x-2)$
2. Factor completely.

(a) $4z^2 - 8z$
(b) $2bx - 6by + 4bz$
(c) $-12ax^3y - 18ax^2y^2 + 24ax^2$
(d) $y^2 + 5y - 6$
(e) $x^2 - 11x + 24$
(f) $4a^2 - 36$
(g) $49x^2 - 144$
(h) $12x^3 - 3x$
(i) $5c^2 - 25c + 30$
(j) $3x^2y - 6xy - 105y$
(k) $2x^2 - x - 3$
(l) $4x^2 + 5x - 6$
(m) $6x^2 - 11x + 5$
(n) $4x^2 + 8x - 5$
(o) $21ab - 14ax + 15by - 10xy$
(p) $x^2 + 7x - 2xy - 14y$
(q) $12x^2y - 9xy - 28x + 21$
(r) $3x^4 + 6x^3 - 5x^3y - 10x^2y$

3. Solve and check.

(a) $6a - a = 4a + 2$
(b) $8 + 3t - t = 6 + t$
(c) $5h - (h + 2) = 7 + (h + 3)$
(d) $6z - 5 - 7z = 10 - 2z + 3$
(e) $0 = 7 - 2k + 3 - 3k$
(f) $2y - 3(4y - 8) = 2(5 + y) - 10$
(g) $\frac{8d}{5} = -16$
(h) $m^2 - 3m - 4 = 0$
(i) $x^2 - 10x = -24$
(j) $4p^2 - 10p = 0$
(k) $5y^2 = -15y$
(l) $9z^2 - 25 = 0$
(m) $49 = 81x^2$

4. Solve the following inequalities and sketch the solution.

(a) $5x - 3 < 12$
(b) $8 - 3x \geq 11$
(c) $6x + 7 > 4x - 3$
(d) $5 - 2(x - 3) \leq 7$

5. Solve for the indicated variable.

(a) Solve for y: $3x - 2y = 5$

(b) Solve for p_2: $p_1v_1 = p_2v_2$

(c) Solve for g: $V = K + gt$

(d) Solve for m: $F = \dfrac{mv^2}{r}$

6. Translate the following into algebraic expressions using a variable.

   (a) 5 less than twice an unknown number.

   (b) the price of x pants at \$45 each and y shirts at \$23 each.

   (c) 3 times a number increased by 7.

   (d) 4 times the difference of a number and 11.

7. Define variable, solve by equation.

   (a) If twice an unknown number is added to thirteen, the sum if twenty-five. Find the unknown number.

   (b) When three times an unknown number is subtracted from 20, the result is the unknown number. Find the unknown number.

   (c) If five times a number is subtracted from 23, the result is equal to twice the number increased by nine. Find the unknown number.

8. Express the answer in Scientific Notation.

   (a) $\dfrac{(10 \times 10^8)(4 \times 10^{-1})}{2 \times 10^{-9}}$

   (b) $\dfrac{6.3 \times 10^{-5}}{(6 \times 10^{-4})(2.1 \times 10^{-4})}$

   (c) $\dfrac{(3.2 \times 10^{-4})(4 \times 10^{-11})}{1.6 \times 10^3}$

   (d) $\dfrac{(2 \times 10^{-3})(4 \times 10^{-5})}{(8 \times 10^{-6})(2 \times 10^{-7})}$

   (e) $\dfrac{(5.4 \times 10^{-7})(3 \times 10^{-2})}{(1.8 \times 10^{-3})(1.5 \times 10^{-4})}$

   (f) $\dfrac{(8 \times 10^9)(5 \times 10^{-6})}{(1.25 \times 10^5)(2 \times 10^2)}$