Math 98 **Final Review 3** Answers

To receive full credit, show all steps.

1. Simplify each of the following.

   (a) $(5a-1)^2 =$ $25a^2-10a+1$

   (b) $(3x^5+4y)(3x^5-4y) =$ $9x^{10}-16y^2$

   (c) $\dfrac{3a-8}{8-3a} =$ -1

   (d) $\dfrac{2x+1}{4x^2-1} =$ $\dfrac{1}{2x-1}$

   (e) $\dfrac{ab-a-b+1}{b^2-1} =$ $\dfrac{a-1}{b+1}$

   (f) $\dfrac{5x-30}{x^2-36}\cdot\dfrac{3x+18}{5} =$ 3

   (g) $\dfrac{3x}{x-2}-\dfrac{x+4}{x-2} =$ 2

   (h) $2^0+(-2)^0 =$ 2

   (i) $2^3\cdot(2^{-2})^{-2} =$ 128

   (j) $(2^3\cdot 2^{-2})^{-2} =$ $\dfrac{1}{4}$

   (k) $2a^3(-2ab^{-2})^{-2}ab^0 =$ $\dfrac{a^2b^4}{2}$

   (l) $\dfrac{(-2x)^2y^{-3}}{2x^{-3}y^2} =$ $\dfrac{2x^5}{y^5}$

   (m) $(x-y)(x^5+x^4y+x^3y^2+x^2y^3+xy^4+y^5) =$ x^6-y^6

2. Factor completely each of the following:

   (a) $4a^2mn-15abm^2-6abmn+10a^2m^2 =$ $ma(5m+2n)(2a-3b)$

   (b) $a^2x^3-b^2x-a^2x+b^2x^3 =$ $x(a^2+b^2)(x-1)(x+1)$

   (c) $162a+162b-2ax^4-2bx^4 =$ $2(3-x)(x+3)(x^2+9)(a+b)$

3. Factor by grouping.

   (a) $x^2-6x+8 =$ $(x-2)(x-4)$

   (b) $3a^2-5a-2 =$ $(3a+1)(a-2)$

   (c) $4b^2-b-5 =$ $(4b-5)(b+1)$

4. Solve each of the following equations. Make sure to check your solutions.

   (a) $\dfrac{2x+1}{5}-\dfrac{5-x}{2}=x-1$ -13

(b) $-3(2x-1)-(3-7x)=2(x+1)-(x-1)$ no solution found

(c) $8x^3=50x^2$ $0, \frac{25}{4}$

(d) $8p^3=50p$ $-\frac{5}{2}, 0, \frac{5}{2}$

(e) $2-(3-x)(2x+5)=(x-1)(2x-1)$ 7

(f) $8a+2a^2=42$ $-7, 3$

5. Solve each of the following inequalities. Graph the solution set.

(a) $\frac{3-4x}{3}-\frac{2x-3}{7}\leq -x+7$ $x\geq -9$

(b) $\frac{3-2a}{7}>-1$ $x<5$

(c) $3(2x-3)-(5x+4)>-14$ $x>-1$

6. Solve each of the following formulas.

(a) $A=2a-3b$ for a $a=\frac{A}{2}+\frac{3b}{2}$

(b) $A=2a-3b$ for b $b=\frac{2a}{3}-\frac{A}{3}$

(c) $F=\frac{mMG}{d^2}$ for m. $m=\frac{Fd^2}{GM}$

(d) $3x-5y=60$ for y. $y=\frac{3}{5}x-12$

7. Graph the straight lines $5x-3y=11$ and $y=-x-9$ in the same coordinate system.

(a) Use your graph to find th coordinates of the point where the lines intersect. $(-2,-7)$

(b) Use algebraic methods to check your solution for part a).

8. Word Problems.

(a) A couch went on a 15% sale. The sale price is \$ 697. Find the original price. \$ 820

(b) The difference between two numbers is 7, their sum is 37. Find these numbers. 15, 22

(c) Ann and Betty are roommates. The monthly rent is \$ 950. The amount paid by Ann is \$ 310 less than twice the amount paid by Betty. How much do they each pay for rent? \$ 420, 530

(d) The population of a town has decreased from 90 000 to 82 800. What percent of a change does this represent? 8%

(e) One side of a rectangle is 4 ft shorter than three times the other side. Find the sides if the perimeter is 64 ft. 9 ft, 23 ft

(f) One side of a rectangle is 4 ft shorter than three times the other side. Find the sides if the area is 84 ft^2. 6 ft, 14 ft