To receive full credit, show all steps.

1. Simplify each of the following.

   (a) $(3x-7)^2 =$

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

   (c) $\dfrac{2x-7}{7-2x} =$

   (d) $\dfrac{2x+6}{18x-2x^3} =$

   (e) $\dfrac{6xy-2y-3x+1}{9x^2-1} =$

   (f) $\dfrac{3a-12}{3a+15}\cdot\dfrac{5a+20}{a^2-16} =$

   (g) $\dfrac{7x-13}{2x-5}-\dfrac{7-x}{2x-5} =$

   (h) $-3^0-(-3)^0 =$

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

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

   (k) $2^5x^{-2}(-2x^{-2})^{-3} =$

   (l) $\dfrac{(-3ab)^3ab^{-3}}{-3b^{-3}a^2(3a^{-1}b)^2} =$

   (m) $(a+b)(a^4-a^3b+a^2b^2-ab^3+b^4) =$

2. Factor completely each of the following:

   (a) $2bnxy-4anxy+12anx^2-6bnx^2 =$

   (b) $75bm^3-150am^3+24am^5-12bm^5 =$

   (c) $240a^5p-160a^5q-15apx^4+10aqx^4 =$

3. Factor by grouping.

   (a) $4b+b^2-21 =$

   (b) $14p^2-p-3 =$

   (c) $14m+5m^2-3 =$

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

   (a) $\dfrac{3x-1}{5}-\dfrac{7-x}{3}=x-2$

   (b) $5(x-2)-(3-4x)=8(x-2)-(5-x)$

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(c) $5p^7 = 20p^6$

(d) $5p^7 = 20p^5$

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

(f) $m^2+55 = 16m$

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

(a) $\dfrac{2a+1}{5} - \dfrac{7-a}{2} > -a-9$

(b) $\dfrac{5-y}{3} \geq -8$

(c) $(3x-8)-(4x-5) > x-3$

6. Solve each of the following formulas.

(a) $P = 5x-2y$ for x.

(b) $P = 5x-2y$ for y.

(c) $V = \dfrac{\pi r^2 h}{3}$ for h.

(d) $7a-3b = 42$ for b.

7. Graph the straight lines $2x+y=5$ and $y=-x+1$ in the same coordinate system.

(a) Use your graph to find th coordinates of the point where the lines intersect.

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

8. Word Problems.

(a) The population of a town has decreased by 10%. Now there are 7650 residents. Find the original population.

(b) The difference between two numbers is 34, their sum is 20. Find these numbers.

(c) Ann and Betty are roommates. The monthly rent is \$ 980. The amount paid by Ann is \$ 130 less than twice the amount paid by Betty. How much do they each pay for rent?

(d) The price of a TV is \$ 680. If this price was to be changed to \$ 442, what percent of a change does this represent?

(e) One side of a rectangle is 5 ft shorter than twice the other side. Find the sides if the perimeter is 32 ft.

(f) One side of a rectangle is 5 ft shorter than twice the other side. Find the sides if the area is 150 ft^2.

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