

Name Key

Date day/

1. Factor completely:  $7cd^2e - 14de$   
 $7de(cd-2)$

2. Factor completely:  $3x^2 - 75$   
 $3(x^2 - 25)$   
 $3(x+5)(x-5)$

1-8 factoring

3. Factor completely:  $x^4 - 16y^4$   
 $(x^2)^2 - (4y^2)^2$

4. Factor completely:  $4x^2 + 8x + 4$   
 $4(x^2 + 2x + 1)$   
 $4(x+1)(x+1)$

$(x^2 - 4y^2)(x^2 + 4y^2)$   
 $(x-2y)(x+2y)(x^2 + 4y^2)$

5. Simplify:  $25 - (x+2)^2$   
 $25 - (x^2 + 4x + 4)$   
 $25 - x^2 - 4x - 4$   
 $-x^2 - 4x + 21$   
 $-(x^2 + 4x - 21)$   
 $-(x+7)(x-3)$

6. Factor:  $25x^2 - 9$   
 $(5x-3)(5x+3)$

7. Factor:  $9g^2 + 12g + 4$   
 $(9g + 6)(9g + 6)$   
 $\frac{3}{3} \frac{3}{3} = (3g+2)^2$

8. Factor:  $g^2 + 2gh + h^2 = (g+h)^2$

also perfect square trinomial  
 $12 = 2\sqrt{9}\sqrt{4}$

9. Which of these expressions is a perfect trinomial?  
 a)  $100k^2 + 10k + 1$     b)  $16k^2 - 8k - 1$   
 c)  $36k^2 + 12k + 1$     d)  $16k^2 + 15k - 1$   
 e)  $9k^2 + 6k - 1$

10. Factor  $xy^2 - y^3 - 4x + 4y$  completely.  
 by grouping:  
 $(xy^2 - y^3) - (4x - 4y)$   
 $y^2(x-y) - 4(x-y)$   
 $(y^2 - 4)(x-y)$

11. Factor completely:  $xy - 4y + 2x - 8$   
 $(xy - 4y) + (2x - 8)$   
 $y(x-4) + 2(x-4)$   
 $(y+2)(x-4)$

12. Factor:  $x^2 - 16x + 48$   
 $(x-12)(x-4)$

13. Factor:  $x^2 + 3x - 28$   
 $(x+7)(x-4)$

14. Factor:  $2x^2 + 13x - 15$   
 $(2x+15)(x-1)$

15. Factor:  $2x^2 - x - 15$   
 $(2x-6)(x+5)$   
 $(x-3)(2x+5)$

16. Factor:  $3x^2 + 17x + 10$   
 $(3x+15)(x+2)$   
 $(x+5)(3x+2)$

17. Factor:  $5x^2 - 14x + 8$

$$(5x-10)(5x-4)$$

40	-14
	-10-4

$$(x-2)(5x-4)$$

19. Solve:  $\frac{5}{3x} = \frac{2}{3x-7}$

$$6x = 5(3x-7)$$

$$6x = 15x - 35$$

$$35 = 9x$$

$$x = \frac{35}{9}$$

21. Solve the equation  $\frac{8}{x^2-16} + \frac{3}{4} = \frac{1}{x-4}$

$$\frac{8(x+4)(x-4)}{(x+4)(x-4)} + \frac{3(x+4)(x-4)}{4} = \frac{1(x+4)(x-4)}{(x-4)}$$

$$32 + 3(x+4)(x-4) = 4(x+4)$$

$$32 + 3(x^2-16) = 4x+16$$

$$32 + 3x^2 - 48 = 4x + 16$$

$$3x^2 - 4x - 32 = 0$$

$$(3x-12)(x+8) = 0$$

$$(x-4)(3x+8) = 0$$

23. Solve for x:  $\frac{x}{2} + \frac{x}{3} = 40$

$$x \frac{(2)(3)}{2} + x \frac{(2)(3)}{3} = 40(2)(3)$$

$$3x + 2x = 240$$

$$5x = 240$$

$$x = 48$$

25. Solve:  $2x - 3y = 12$

$$7x - 5y = 9$$

$$-5(2x-3y) = -5(12)$$

$$3(7x-5y) = 3(9)$$

$$-10x + 15y = -60$$

$$21x - 15y = 27$$

$$11x = -33$$

$$x = -3$$

$$2(-3) - 3y = 12$$

$$-6 - 3y = 12$$

$$-3y = 18$$

$$y = -6$$

$$(-3, -6)$$

18. Factor:  $2x^2 - 13xy + 15y^2$

$$(2x-10y)(2x-3y)$$

30	-1	-13
	10	-10-3

$$(x-5y)(2x-3y)$$

20. Solve:  $\frac{2}{x+5} + \frac{4x-1}{x^2+3x-10} = \frac{1}{x-2}$

$$\frac{2(x+5)(x-2)}{(x+5)(x-2)} + \frac{(4x-1)(x+5)(x-2)}{(x+5)(x-2)} = \frac{1(x+5)(x-2)}{(x+5)(x-2)}$$

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

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

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

$$5x = 10$$

$$x = 2$$

but  $x=2$  disallowed, no solution

22. Solve for x if  $\frac{3}{x} - 2 = \frac{-2x}{x+1}$

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

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

$$3x+3 - 2x^2 - 2x = -2x^2$$

$$x+3 = 0$$

$$x = -3$$

24. Find the x- and y-intercepts of the line  $7x - 2y = 1$ .

$$\left(\frac{1}{7}, 0\right) \quad \left(0, -\frac{1}{2}\right)$$

26. Find the intersection  $x - y = 4$

$$3x^2 - x + y = 8$$

$$x = y + 4$$

$$3(y+4)^2 - (y+4) + y = 8$$

$$3(y^2+8y+16) - y - 4 + y = 8$$

$$3y^2 + 24y + 48 - y - 4 + y = 8$$

$$3y^2 + 24y + 36 = 0$$

$$\frac{(3y+18)}{3} \cdot \frac{(3y+6)}{3} = 0$$

$$(y+6)(y+2) = 0$$

$$y = -6 \Rightarrow x = -2$$

$$y = -2 \Rightarrow x = 2$$

$$(-2, -6) \quad (2, -2)$$

108	24
	18+6

6. Find the intersection  $y - 2x - 3 = 0$

$$+ x^2 - y = 0$$

$$\begin{array}{r} x^2 - 2x - 3 = 0 \\ (x-3)(x+1) \end{array} \quad \begin{array}{r} -3 \\ -2 \\ -3+1 \end{array}$$

$$\begin{array}{l} x=3 \quad x=-1 \\ y=9 \quad y=1 \end{array}$$

$$y = x^2$$

$$(3, 9) \quad (-1, 1)$$

29. Solve  $-5 + 3a^2 = -2$

$$3a^2 = 3$$

$$a^2 = 1$$

$$a = \pm 1$$

31. The solution set of  $x^2 - 2x - 8 = 0$  is

- a)  $\{4, -2\}$    b)  $\{-4, 2\}$    c)  $\{-2, 8\}$    d)  $\{6, 2\}$

$$\begin{array}{r} (x-4)(x+2) \quad -8 \\ \hline -4+2 \end{array}$$

$$x = 4, -2$$

Solve.

33. Solve by factoring.  $2m - m^2 = 0$

$$m(2-m) = 0$$

$$m = 0, m = 2$$

35. Solve for  $x$ :  $(x-7)^2 - 3 = 16$

$$(x-7)^2 = 19$$

$$x-7 = \pm\sqrt{19}$$

$$x = 7 \pm \sqrt{19}$$

37. Solve.  $(5a-1)^2 = 68$

$$5a-1 = \pm\sqrt{68} = \pm\sqrt{4}\sqrt{17} = \pm 2\sqrt{17}$$

$$5a = 1 \pm 2\sqrt{17}$$

$$a = \frac{1}{5} \pm \frac{2}{5}\sqrt{17}$$

39. Solve by completing the square:  $x^2 - 4x - 1 = 0$

$$x^2 - 4x + 4 = 1 + 4$$

$$(x-2)^2 = 5$$

$$x-2 = \pm\sqrt{5}$$

$$x = 2 \pm \sqrt{5}$$

day 2

$(28-51)$  Solving

28. Solve:  $16t^2 + 8t + 1 = 0 = a^2 + 2ab + b^2 = (a+b)^2$

$$\begin{array}{r} \downarrow \quad \downarrow \\ 4t \quad 1 \\ (4t+1)^2 = 0 \\ 4t+1 = 0 \\ 4t = -1 \\ t = -\frac{1}{4} \end{array}$$

30. Solve the equation  $2x^2 - 98 = 0$  for the positive value of  $x$ .

$$2x^2 = 98$$

$$x^2 = 49$$

$$x = 7$$

32. The solution set for  $2x^2 - 7x - 4 = 0$  is

a)  $\{2, -1\}$

b)  $\{-\frac{1}{2}, 4\}$

c)  $\{-2, 1\}$

d)  $\{\frac{1}{2}, -4\}$

$$\begin{array}{r} (2x-8)(2x+1) \quad -8 \\ \hline -8+1 \end{array}$$

$$(x-4)(2x+1) = 0 \quad x = 4 \quad x = -\frac{1}{2}$$

34. Solve:  $(x+2)^2 = 14$

$$x+2 = \pm\sqrt{14}$$

$$x = -2 \pm \sqrt{14}$$

36. Solve:  $3(n+4)^2 = 45$

$$(n+4)^2 = 15$$

$$n+4 = \pm\sqrt{15}$$

$$n = -4 \pm \sqrt{15}$$

38. Consider solving  $x^2 + 14x + 3 = 0$  by completing the square.

$$x^2 + 14x + 49 = -3 + 49$$

What is the number that goes in the blanks?

Solve by completing the square.

40.  $a^2 + 7 = -6a$

$$a^2 + 6a + 9 = -7 + 9$$

$$(a + 3)^2 = 2$$

$$a + 3 = \pm\sqrt{2} \quad | \quad a = -3 \pm \sqrt{2}$$

Solve using the quadratic formula.

42.  $0 = 2z^2 + 20z + 1$

$$z = \frac{-20 \pm \sqrt{400 - 4(2)(1)}}{2(2)} = \frac{-20 \pm \sqrt{392}}{4}$$

$$= \frac{-20 \pm \sqrt{2} \sqrt{4} \sqrt{49}}{4} = \frac{-20 \pm 14\sqrt{2}}{4} = \boxed{-5 \pm \frac{7}{2}\sqrt{2}}$$

44. Use the quadratic equation. What are the roots of the equation  $2x^2 + 3x - 4 = 0$ ?

$$x = \frac{-3 \pm \sqrt{9 + 4(2)(4)}}{2(2)} = \frac{-3 \pm \sqrt{41}}{4}$$

46. Solve for  $x$ :  $\sqrt{8-x} + 6 = 4$

$$\sqrt{8-x} = -2$$

$$8-x = 4$$

$$x = 4$$

extraneous  
no solution

Solve.

48.  $\sqrt{3m+4} = 1 + \sqrt{m+5}$

$$3m+4 = 1 + 2\sqrt{m+5} + m+5$$

$$3m+4 = 6 + m + 2\sqrt{m+5} \quad | \quad m+5 = m^2 - 2m + 1$$

$$2m - 2 = 2\sqrt{m+5}$$

$$2(m-1) = 2\sqrt{m+5}$$

$$m-1 = \sqrt{m+5}$$

$$m^2 - 3m - 4 = 0$$

$$(m+1)(m-4) = 0$$

$$m = -1, 4$$

ex

50. Solve:  $|2x - 11| = 3$

$$2x - 11 = 3$$

$$2x - 11 = -3$$

$$2x = 14$$

$$2x = 8$$

$$x = 7$$

$$x = 4$$

41. Solve:  $4x^2 - 16x + 3 = 0$

$$4x^2 - 16x = -3$$

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

$$4(x-2)^2 = -3 + 16 = 13$$

$$(x-2)^2 = \frac{13}{4}$$

$$x-2 = \pm \sqrt{\frac{13}{4}} = \pm \frac{\sqrt{13}}{2}$$

$$x = 2 \pm \frac{1}{2}\sqrt{13}$$

43. Solve:  $x^2 - 2x = 17$

$$x^2 - 2x + 1 = 18$$

$$x = \frac{2 \pm \sqrt{4 + 4(1)(18)}}{2} = \frac{2 \pm \sqrt{72}}{2} = \frac{2 \pm \sqrt{9} \sqrt{4} \sqrt{2}}{2}$$

$$= \frac{2 \pm 6\sqrt{2}}{2} = \boxed{1 \pm 3\sqrt{2}}$$

45. Solve:  $\sqrt{x+7} = 9$

$$(\sqrt{x+7})^2 = 81$$

$$x+7 = 81$$

$$x = 74$$

47. Solve:  $\sqrt{x-2} - x = -8$

$$\sqrt{x-2} = x-8$$

$$x-2 = (x-8)^2 = x^2 - 16x + 64$$

$$x^2 - 17x + 66 = 0$$

$$x = \frac{17 \pm \sqrt{289 - 4(66)}}{2} = \frac{17 \pm 5}{2} = 11, \text{ ex}$$

49.  $\sqrt{20-c} = 6 - \sqrt{c}$

$$(\sqrt{20-c})^2 = (6 - \sqrt{c})^2$$

$$20 - c = 36 - 12\sqrt{c} + c$$

$$12\sqrt{c} = 16 + 2c$$

$$\frac{12\sqrt{c}}{2} = \frac{16 + 2c}{2}$$

$$6\sqrt{c} = 8 + c$$

$$(6\sqrt{c})^2 = (c+8)^2$$

$$36c = c^2 + 16c + 64$$

$$c^2 - 20c + 64 = 0$$

$$(c-4)(c-16) = 0$$

$$c = 4, c = 16$$

$$\text{check: } \sqrt{20-4} = 6 - \sqrt{4}, \sqrt{20-16} = 6 - \sqrt{16}$$

$$4=4 \quad 2=2$$

51. Solve for  $x$ :  $-3|3-4x| = -18$

$$|3-4x| = 6$$

$$3-4x = 6$$

$$3-4x = -6$$

$$-4x = 3$$

$$-4x = -9$$

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

$$x = \frac{9}{4}$$

## P.4 Review WS

Name \_\_\_\_\_

Date \_\_\_\_\_

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3. Factor completely:  $x^4 - 16y^4$
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  - b)  $16k^2 - 8k - 1$
  - c)  $36k^2 + 12k + 1$
  - d)  $16k^2 + 15k - 1$
  - e)  $9k^2 + 6k - 1$
10. Factor  $xy^2 - y^3 - 4x + 4y$  completely.
11. Factor completely:  $xy - 4y + 2x - 8$
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13. Factor:  $x^2 + 3x - 28$
14. Factor:  $2x^2 + 13x - 15$
15. Factor:  $2x^2 - x - 15$
16. Factor:  $3x^2 + 17x + 10$

17. Factor:  $5x^2 - 14x + 8$

18. Factor:  $2x^2 - 13xy + 15y^2$

19. Solve:  $\frac{5}{3x} = \frac{2}{3x-7}$

20. Solve:  $\frac{2}{x+5} + \frac{4x-1}{x^2+3x-10} = \frac{1}{x-2}$

21. Solve the equation  $\frac{8}{x^2-16} + \frac{3}{4} = \frac{1}{x-4}$ .

22. Solve for  $x$  if  $\frac{3}{x} - 2 = \frac{-2x}{x+1}$ .

23. Solve for  $x$ :  $\frac{x}{2} + \frac{x}{3} = 40$

24. Find the  $x$ - and  $y$ -intercepts of the line  $7x - 2y = 1$ .

25. Solve:  $2x - 3y = 12$   
 $7x - 5y = 9$

26. Find the intersection  $x - y = 4$   
 $3x^2 - x + y = 8$

27. Find the intersection  $y - 2x - 3 = 0$   
 $x^2 - y = 0$

28. Solve:  $16t^2 + 8t + 1 = 0$

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a)  $\{4, -2\}$  b)  $\{-4, 2\}$  c)  $\{-2, 8\}$  d)  $\{6, 2\}$

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a)  $\{2, -1\}$  b)  $\{-\frac{1}{2}, 4\}$

c)  $\{-2, 1\}$  d)  $\{\frac{1}{2}, -4\}$

Solve.

33. Solve by factoring.  $2m - m^2 = 0$

34. Solve:  $(x + 2)^2 = 14$

35. Solve for  $x$ :  $(x - 7)^2 - 3 = 16$

36. Solve:  $3(n + 4)^2 = 45$

37. Solve.  $(5a - 1)^2 = 68$

38. Consider solving  $x^2 + 14x + 3 = 0$  by *completing the square*.

$$x^2 + 14x + \underline{\hspace{1cm}} = -3 + \underline{\hspace{1cm}}$$

What is the number that goes in the blanks?

39. Solve by completing the square:  $x^2 - 4x - 1 = 0$

Solve by completing the square.

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Solve using the quadratic formula.

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Solve.

48.  $\sqrt{3m+4} = 1 + \sqrt{m+5}$

49.  $\sqrt{20-c} = 6 - \sqrt{c}$

50. Solve:  $|2x - 11| = 3$

51. Solve for  $x$ :  $-3|3 - 4x| = -18$