

Review
Simplify. $\left(\frac{x^5 y^{-3} z^2}{x^{-2} y^3 z} \right)^{-2}$

$$= \frac{x^{-10} y^6 z^{-4}}{x^4 y^{-6} z^{-2}} = \frac{y^{6-(-6)}}{x^{4-(-10)} z^{-2-(-4)}}$$

$$= \frac{y^{12}}{x^{14} z^2}$$

Homework questions?

57. $(a-b)^3 - b^3$

$$(a-b-b) \left((a-b)^2 + (a-b)b + b^2 \right)$$

$$(a-2b) \left(a^2 - 2ab + b^2 + ab - b^2 + b^2 \right)$$

$$(a-2b) \left(a^2 - ab + b^2 \right)$$

$$\begin{aligned}
 59. \quad & x^{6n} + y^{3n} \\
 & (x^{2n})^3 + (y^n)^3 \\
 & (x^{2n} + y^n)(x^{4n} - x^{2n}y^n + y^{2n})
 \end{aligned}$$

$$\begin{aligned}
 15. \quad & x^2 + 6xy + 9y^2 \\
 & (x)^2 + 2(x)(3y) + (3y)^2 \\
 & (x + 3y)^2
 \end{aligned}$$

$$71. x^4 y^4 - 8x^2 y^2 + 12$$

$$\underbrace{x^4 y^4 - 6x^2 y^2} - \underbrace{2x^2 y^2} + 12$$

$$x^2 y^2 (x^2 y^2 - 6) - 2(x^2 y^2 - 6)$$

$$(x^2 y^2 - 6)(x^2 y^2 - 2)$$

$$67. x^4 - 9x^2 + 18$$

$$(x^2 - 6)(x^2 - 3)$$

$$\rightarrow \underbrace{x^4 - 6x^2} - \underbrace{3x^2 + 18}$$

⋮

5.7 Solving Equations by Factoring

Zero Product Property:

If $AB = 0$, then $A = 0$ or $B = 0$.

$$(x+2)(x-5)(3x+4) = 0$$

Set each factor = 0 & solve for x

$$x+2=0$$

$$x = -2$$

$$x-5=0$$

$$x = 5$$

$$3x+4=0$$

$$3x = -4$$

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

$$(x-3)(x+4)(x-2) = 5$$

~~$$x-3=5, x+4=5, x-2=5$$~~

5.7

$$14. \quad x^2 + x - 6 = 0$$

$$(x + 3)(x - 2) = 0$$

$$x + 3 = 0 \quad x - 2 = 0$$

$$x = -3 \quad x = 2$$

$$20. \quad 2y^2 - 10y = 0$$

$$2y(y - 5) = 0$$

$$2y = 0 \quad y - 5 = 0$$

$$y = 0 \quad y = 5$$

$$26. 4y^2 - 19y = 5$$

$$4y^2 - 19y - 5 = 0$$

$$4y^2 - 20y + y - 5 = 0$$

$$4y(y-5) + 1(y-5) = 0$$

$$(y-5)(4y+1) = 0$$

$$y-5=0 \quad 4y+1=0$$

$$y=5 \quad 4y=-1$$

$$y=-\frac{1}{4}$$

$$40. (x+2)(x-6) = 20$$

$$(x+2)(x-6) - 20 = 0$$

$$x^2 - 6x + 2x - 12 - 20 = 0$$

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

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

$$x-8=0 \quad x+4=0$$

$$x=8 \quad x=-4$$

$$48. \quad \underbrace{2x^3 + x^2 - 8x - 4}_{(2x+1)(x^2-4)} = 0$$

$$x^2(2x+1) - 4(2x+1) = 0$$

$$(2x+1)(x^2-4) = 0$$

$$(2x+1)(x-2)(x+2) = 0$$

$$2x+1=0 \quad x-2=0 \quad x+2=0$$

$$2x = -1$$

$$x = 2$$

$$x = -2$$

$$x = -\frac{1}{2}$$

$$32. \quad t(t+1) = 42$$

$$t^2 + t - 42 = 0$$

$$(t+7)(t-6) = 0$$

$$t+7=0 \quad t-6=0$$

$$t = -7, 6$$

$$42. \quad (a-9)(a-1) = -7$$

$$a^2 - a - 9a + 9 + 7 = 0$$

$$a^2 - 10a + 16 = 0$$

$$(a-8)(a-2) = 0$$

$$a-8=0 \quad a-2=0$$

$$a = 8, 2$$

$$46. \quad (2-b)^2 + b^2 = 10$$

$$4 - 4b + b^2 + b^2 - 10 = 0$$

$$2b^2 - 4b - 6 = 0$$

$$2(b^2 - 2b - 3) = 0$$

$$2(b+1)(b-3) = 0$$

$$b+1=0 \quad b-3=0$$

$$b = -1, 3$$

$$50. \quad 12x^3 - 8x^2 - 3x + 2 = 0$$

$$4x^2(3x-2) - 1(3x-2) = 0$$

$$(3x-2)(4x^2-1) = 0$$

$$(3x-2)(2x-1)(2x+1) = 0$$

$$3x-2=0 \quad 2x-1=0 \quad 2x+1=0$$

$$3x=2 \quad 2x=1 \quad 2x=-1$$

$$x = \frac{2}{3}, \frac{1}{2}, -\frac{1}{2}$$

$$52. f(x) = x^2 + 4x - 2 \quad ; \quad f(c) = 3$$

Find all values of c for which $f(c) = 3$.

$$f(c) = c^2 + 4c - 2$$

$$3 = c^2 + 4c - 2$$

$$0 = c^2 + 4c - 5$$

$$0 = (c+5)(c-1)$$

$$c+5=0 \quad c-1=0$$

$$c = -5, c = 1$$

$$58. f(x) = x^3 + 3x^2 - 4x - 11 \quad ; \quad f(c) = 1$$

$$x^3 + 3x^2 - 4x - 11 = 1$$

$$x^3 + 3x^2 - 4x - 12 = 0$$

$$x^2(x+3) - 4(x+3) = 0$$

$$(x+3)(x^2-4) = 0$$

$$(x+3)(x+2)(x-2) = 0$$

$$x+3=0, x+2=0, x-2=0$$

$$x = -3, -2, 2$$

$$64. \quad x^3 + 7x = 8x^2$$

$$x^3 - 8x^2 + 7x = 0$$

$$x(x^2 - 8x + 7) = 0$$

$$x(x-7)(x-1) = 0$$

$$x=0 \quad x-7=0 \quad x-1=0$$

$$x=7 \quad x=1$$

72. height of a \triangle is 4cm more than twice the length of base.
Area of \triangle is 35 cm^2 . Find height.

$$35 = \frac{1}{2}(b)(4+2b)$$

$$35 = 2b + b^2$$

$$0 = b^2 + 2b - 35$$

$$0 = (b+7)(b-5)$$

$$b+7=0$$

$$\cancel{b=-7}$$

$$b-5=0$$

$$b=5$$



$$\text{Area} = \frac{1}{2} \text{base} \cdot \text{height}$$

$$h = 4 + 2(5) = \boxed{14 \text{ cm}}$$

5.7

35-49 odd

solve

51-57 odd

$f(c) = \sim$

61-75 odd

word prob's