

6.1 Exponent properties

$$x^n x^m = x^{n+m}$$

multiply with same base → add exponents

$$\frac{x^n}{x^m} = x^{n-m}$$

dividing w/ same base → subtract exponents

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$$2^2 \cdot 2^3 = 2^5$$

$$(2 \cdot 2)(2 \cdot 2 \cdot 2) = 2^5$$

$$\frac{2^5}{2^2} = 2^{5-2} = 2^3$$

$$2^3 \cdot 3^2 = 8 \cdot 9 = 72$$
~~$$\frac{2 \cdot 2 \cdot 2 \cdot 2}{2 \cdot 2}$$~~

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6.2 more exponents

$$(x^m)^n = x^{m \cdot n}$$

$$(2^2)^3 = (2 \cdot 2)^3$$

$$= (2 \cdot 2)(2 \cdot 2)(2 \cdot 2) = 2^6$$

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$$(xy)^m = x^m y^m$$

$$(xy)^3 = (xy)(xy)(xy)$$

$$= (xyxyxy)$$

$$= xxxyyy$$

$$= x^3 y^3$$

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6.3 simplifying polynomials

monomial: an expression with exactly one term

Polynomial: an expression with more than one term

monomial $3x$
 polynomial $3x + 6 + y^2$

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6.4 Adding polynomials

add like terms

~~$$2x^4$$~~

$$\begin{array}{r} y^3 + 3y^2 - 9y \\ -(3y^2 - 8y + 4) \\ \hline y^3 - 9y + 8y - 4 \\ y^3 - y - 4 \end{array}$$

$$\begin{array}{r} y^3 + 3y^2 - 9y \\ -3y^2 + 8y - 4 \\ \hline y^3 - y - 4 \end{array}$$

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6.5 multiplying polynomials

Distributive law

$$m^2 - 3m + 6 + 5(2m^2 - m - 4)$$

$$m^2 - 3m + 6 + 10m^2 - 5m - 20$$

$$\underline{11m^2 - 8m - 14}$$

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$$7a^2(a^3 - 5a^2 + 4)$$

$$7a^2(a^3) + 7a^2(-5a^2) + 7a^2(4)$$

$$7a^5 - 35a^4 + 28a^2$$

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#16

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

$$12x^3 - 9x^2$$

$$(3x)(4x^2)$$

$$12x^3$$

$$12x^2x$$

$$12x^3$$

$$12x^3$$

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6.6 finding factors

1, 2, 3, 5, 7, 11, 13, 17, 19, ...



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6.7 factoring

$$2a^2 + 6a + 10$$

2 2·3 2·5

$$2(a^2 + 3a + 5)$$

$$4b^2 - 20b - 4$$

2·2 2·2·5 2·2

$$4(b^2 - 5b - 1)$$

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$$b^3 - 2b^2 + b$$

$$b b b - 2 b b + b$$

$$b(b^2 - 2b + 1)$$

$$b^3 - 2b^2 + b$$

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$$4r^2 = 12r + 28$$

$$4(r^2 - 3r + 7)$$

#23

$$5t^8 - 7t^6 + 2t^4$$

$$5t^4t^4 - 7t^4t^2 + 2t^4$$

$$t^4(5t^4 - 7t^2 + 2)$$

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$$6X^3 + 4X^2 - 4X$$

$$2 \cdot 3 \cdot \underline{X} \cdot X \cdot X + 2 \cdot 2 \cdot \underline{X} \cdot X - 2 \cdot \underline{2} \cdot X$$

$$2X(3X^2 + 2X - 2)$$

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$$5y^{4m+2} + 10y^{4m+6}$$

$$5y^{4m+2}(1 + 2y^4)$$

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