Chapter 0 Prerequisite Topics

Sections:

0.1 Simplifying Expressions

Video 1   Simplify

$$3\left[7-4(5+1)\right]-3$$

Video 2   Simplify

$$1-6\cdot5-\left[7\cdot(-4-3)\right]$$

Video 3   Simplify

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

b) $\dfrac{5}{7}\cdot\dfrac{14}{25}$

c) $\dfrac{\frac{3}{4}}{\frac{7}{8}}$

Video 4   Simplify

a) $\dfrac{6}{25}-\dfrac{2}{15}$

b) $3\cdot\dfrac{4}{7}+\dfrac{1}{2}$

0.2 The Distributive Property

Video 1   Distribute

a) $5(3x-2)$

b) $3\left(\dfrac{4}{3}x+\dfrac{1}{9}\right)$

c) $5x(2x+4)$

Video 2   Distribute

a) $(x-4)(x+7)$

b) $(x-6)(x-5)$

Video 3   Distribute

$$(x-2)(x^2+3x-5)$$

0.3 Laws of Exponents

Video 1   Simplify each expression

a) $(7x^4)^2$

b) $(x^{-2}y^2)^3$

Video 2   Simplify each expression

a) $\dfrac{x^3 y^5}{x^4 y^2}$

b) $\dfrac{(-1)^5 x^2 (y^2 z)^3}{2^3 xy^4 z^2}$

Video 3   Simplify each expression

a) $\left(\dfrac{4x^{-2}}{5y^{-1}}\right)^2$

b) $\dfrac{x^4 (x^3 y^2)^5}{y^{12}}$

c) $\dfrac{(2xy^3)^2 x^5 z^{-1}}{yz}$

0.4 Polynomials

Video 1   Add or subtract as indicated

a) $(x^3+2x+5x)+(3x^2-2x+6)$

b) $(2x^3+3x^2+1)-1(4x^3-2x^2+x-3)$

c) $7(2-x^3)+3(2+x+2x^2+x^3)$

Video 2   Multiply

a) $(2x-4)(3x+7)$

b) $(-3x+2)(3-4x)$

c) $(x-2y)(-3x+y)$

Video 3   Multiply

    a) $(x-3)(x+3)$

    b) $(5x-2)(5x+2)$

Video 4   Multiply

    a) $(x+6)^2$

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

    c) $(2x-5y)^2$

Video 5   Multiply

    a) $(x-2)^3$

    b) $(3x+2)^3$

Video 6   Divide

$4x^3 - x^2 + x + 2$ by $x+2$

Video 7   Divide

$3x^5 - 2x^2 + 3x - 4$ by $3x^3 - 1$

Video 8   Divide

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

Video 9   Divide

$x^3 - 8$ by $x-2$

0.5 Factoring Polynomials

Video 1   Factor

    b) $9x-27$

    c) $5x^2y - 5xy^2 + 75xy$

    d) $12x^2 - 18x$

Video 2   Factor

  a) $x^2 - 49$
  b) $36x^2 - 1$
  c) $32x^2 - 18$
  d) $20x^4 - 5$

Video 3   Factor

  a) $x^3 + 125$
  b) $27y^3 - x^3$
  c) $64 - 8x^3$

Video 4   Factor

  a) $x^2 + 7x + 12$
  b) $x^2 - 6x + 8$
  c) $x^2 - 3x - 4$
  d) $3x^2 - 15x - 18$

Video 5   Factor

  a) $2x^2 + x - 36$
  b) $8x^2 - 10x - 3$
  c) $5x^2 + 7x + 2$
  d) $6x^2 - 28x + 16$

Video 6   Factor

  a) $x^2 + 6x + 9$
  b) $x^2 + 6x + 9$
  c) $36x^2 - 12xy + y^2$

Video 7   Factor

  a) $3x^5 + 12x^4 y + 2x + 8y$
  b) $3x^7 + 3x^5 + x^4 + x^2$
  c) $x^2 - 16a^2 + 8x + 16$

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0.6 Rational Expressions

Video 1   Reduce

a) $\dfrac{x^2+2x-15}{x^2-7x+12}$

b) $\dfrac{2-5x}{5x-2}$

c) $\dfrac{3x^3+x^2}{3x^4-11x^3-4x^2}$

Video 2   Multiply

a) $\dfrac{x^2+2x-8}{x^2+x-20}\cdot\dfrac{x^2-16}{x^2+5x+4}$

b) $\dfrac{x^2-1}{3x}\div\dfrac{7x-7}{x^2+x}$

c) $\left(\dfrac{x^2-25}{x^2-3x-4}\div\dfrac{x^2+3x-10}{x^2-1}\right)\dfrac{x-2}{x-5}$

Video 3   Add or subtract as indicated

a) $\dfrac{2x-1}{4x+1}-\dfrac{2x}{4x-1}$

b) $\dfrac{2x}{x^2-16}-\dfrac{2x-7}{x^2-7x+12}$

Video 4   Add or subtract as indicated

a) $\dfrac{2}{5+x}+\dfrac{5}{x^2-25}+\dfrac{7}{5-x}$

b) $\dfrac{2}{5+x}+\dfrac{5}{x^2-25}+\dfrac{7}{5-x}$

Video 5   Simplify

a) $\dfrac{2-\dfrac{2}{x}}{1+\dfrac{2}{x}}$

b) $\dfrac{x-\dfrac{1}{x}}{\dfrac{1}{x^2}-1}$

c) $\dfrac{\dfrac{1}{(x+h)^2}-\dfrac{1}{x^2}}{h}$

0.7 Rational Exponents

Video 1 Simplify

a) $\sqrt{64}$

b) $\sqrt[3]{64}$

c) $\sqrt[3]{-216}$

Video 2 Simplify

a) $\sqrt[3]{8x^3y^{12}}$

b) $\sqrt[4]{162x^7}$

c) $\sqrt{\dfrac{4x^4y^2}{25y^6z^8}}$

Video 3 Simplify

a) $\sqrt{4x^3}\sqrt{12x}$

b) $\left(2\sqrt{15x}\right)\left(5\sqrt{3x^2}\right)$

c) $\left(\sqrt[3]{5}\sqrt{9}\right)^2$

Video 4 Simplify

a) $2\sqrt{3}+5\sqrt{3}$

b) $\sqrt{45x}+\sqrt{20x}$

c) $2\sqrt{50x^5}+7\sqrt{2x^3}$

d) $\sqrt[3]{-16}+3\sqrt[3]{54x}-\sqrt[3]{2x}$

Video 5 Perform the indicated operation

a) $\left(\sqrt{2}-5\right)\left(\sqrt{2}+3\right)$

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b) $\left(\sqrt{x}+\sqrt{3}\right)^{2}$

Video 6   Rationalize the denominator

a) $\dfrac{10}{\sqrt{5}}$

b) $\dfrac{-3}{\sqrt{8}}$

c) $\dfrac{\sqrt{3}}{\sqrt{5+2x}}$

d) $\dfrac{\sqrt{7}+\sqrt{3}}{\sqrt{7}-\sqrt{3}}$

Video 7   Rationalize the denominator

a) $\dfrac{-4}{\sqrt[3]{3}}$

b) $\dfrac{\sqrt{x+h}+\sqrt{x}}{\sqrt{x+h}-\sqrt{x}}$

c) $\dfrac{a\sqrt{x}+3}{a\sqrt{x}-3}$

Video 8   Simplify

a) $16^{3/2}$

b) $\left(-27^{2/3}\right)$

c) $\left(-\frac{1}{8}\right)^{1/3}$

Video 9   Simplify

a) $\left(\dfrac{9}{25}\right)^{-3/2}$

b) $\left(\dfrac{27}{8}\right)^{2/3}$

c) $x^{3/4} \cdot x^{1/3} \cdot x^{-1/2}$

Video 10   Simplify

a) $\left(x^3 y^{12}\right)^{4/3}$

b) $\dfrac{(xy)^{1/6}\left(x^2 y^2\right)^{1/2}}{\left(x^2 y\right)^{2/3}}$

c) $\dfrac{\left(16 x^{-1} y^{1/3}\right)^{3/2}}{\left(x^2 y\right)^{3/2}}$

Video 11   Simplify

$$\frac{\left(x^2+9\right)^{1/2} - x^2 \left(x^2+9\right)^{-1/2}}{x^2+9}$$