Section 1.4: Cont'd

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9:31 AM

Square roots:

if $a^2 = b$, then a is called a square root of b

if $a \geq 0$, then a is called the principal square root of b and we write that

$$\sqrt{b} = a$$

example:

$3^2 = 9$
$(-3)^2 = 9$
} both 3 and -3 are square roots of 9

and 3 is the principal square root of 9:

$$\sqrt{9} = 3$$

note: $\sqrt[3]{8} = 2$
$\sqrt[3]{-8} = -2$
} no ambiguity with odd roots

examples:

evaluate

$$\sqrt{3^2 + 4^2} = \sqrt{9 + 16}$$
$$= \sqrt{25}$$

$= 5$

note: $\sqrt{x^2+y^2} \neq \sqrt{x^2} + \sqrt{y^2}$

$$3\left[\sqrt{25+|-11|} + (-2)^3\right]$$

$$= 3\left[\sqrt{25+11} + (-8)\right]$$

$$= 3\left[6 - 8\right]$$

$$= -6$$

$$75 \div (-5)(-3) \div \tfrac{1}{2} \cdot 4$$

$$(-15)(-3)(2)(4)$$

$$(-30)(-3)(4)$$

$$360$$

evaluating algebraic expressions:

if a, b, and c are -3, -2, and -1, respectively, evaluate:

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

$$= 9 - 4 = 5$$

$$\frac{c-a}{c-b} = \frac{-1-(-3)}{-1-(-2)} = \frac{-1+3}{-1+2} = \frac{2}{1} = 2$$

note: $x_1, x_2, x_3, \ldots$

subscripts denote different variables

$x_1 = 5$

$x_2 = -3$