Numbers

- opposite numbers; the absolute value
- integers (positives & negatives); whole numbers (0, 1, 2, ...)
- fractions $\frac{1}{10}$, $\frac{a}{b}$ *reads 'one tenth', 'a over b'*

  key words: mixed numbers $5\frac{3}{4}$, reduce a fraction
- decimal numbers

  0.56 *reads 'oh / zero point fifty-six (hundredths)'*

  $.333\overline{3}$ *reads 'zero point three repeating'*

  key words: round to the nearest tenth / to one decimal place
- the reciprocal of *b* is $\frac{1}{b}$, ratio *a* : *b reads 'a to b'*, percent
- surds / irrational numbers
- number line; infinity

Arithmetic Operations

- $a<b$ *reads 'a is less than b' or 'b is greater than a'*
- $a=b$ *reads 'a is equal to b'*
- addition

  $a+b$ *reads 'a plus b' or 'the **sum** of a and b'*
- subtraction

  $a-b$ *reads 'a minus b' or 'the **difference** of a and b'*
- multiplication

  $a \cdot b$, $a \times b$, $a(b)$ *reads 'a times b' or 'the **product** of a and b'*
- division

  $a \div b$ *reads 'a divided by b' or 'the **quotient** of a and b'*

Arithmetic Operations

- powers

  a^b *reads 'a to the power of b' or 'a to the b-th power'*

  a^2 , b^3 *reads 'a squared', 'b cubed'*

- roots

  $\sqrt[a]{b}$ *reads 'the a-th root of b'*

  $\sqrt{a}$, $\sqrt[3]{b}$ *reads 'the square root of a', 'the cube root of b'*

Algebra

- variable / unknown x $\qquad \frac{(a+b)^2}{3c} \cdot \frac{c}{a+b}$
- expression

  key words: simplify, expand, cancel out, evaluate
- equation $\qquad x+14 = 2y-3x$

  key words: solve for x, combine like terms, transfer, substitute
- inequality
- system of equations / inequalities
- solution

  key words: set, (in)valid, excluded values, infinitely many, check

Order of Operations

Deal with grouping symbols (parentheses or square brackets):

1. Work separately above and below any fraction bar.
2. Use the rules within each set of grouping symbols. Start with the innermost set and work outward.

If no grouping symbols are present:

1. Apply all exponents.
2. Do any multiplications or divisions in the order in which they occur, working from left to right.
3. Do any additions or subtractions in the order in which they occur, working from left to right.

Properties of Operations

- Associative property

$$(a+b)+c = a+(b+c)$$
$$a\times(b\times c) = (a\times b)\times c$$

- Distributive property

$$a(b+c) = ab+ac$$

key words: expand the bracket; factor out a

- Commutative property

$$a+b = b+a$$
$$xy = yx$$