

Basic Theory Quick Reference: Keys and Scales

Quick check for key signatures

Sharp keys

The last sharp of a key signature in the major is the leading note. In this example, the last sharp is a D#, which is the leading note of E major. To work out a key signature of a sharp key, find the sharp a semitone below the tonic note on 'Father Charles ...' and the key signature is all the sharps up to that point.



Father **C**harles **G**oes **D**own **A**nd **E**nds **B**attle

Flat keys

The second-to-last flat of a key signature in the major is the tonic. In this example, the penultimate flat is an Eb, which is the tonic of Eb major. To work out a key signature of a flat key, find the flat that is the tonic note on 'Father Charles ...' and the key signature is all the flats up to that point plus one more.



Battle **E**nds **A**nd **D**own **G**oes **C**harles' **F**ather

Minor keys have the same key signature as their relative major - the major key on the third degree of the scale (i.e. relative major of A minor is C major). Conversely, the relative minor is the minor key on the sixth degree of the scale.

More elaborate method for working out key signatures

Write out all of the flat, natural and sharp notes in a long line of ascending fifths (Father Charles Goes Down And Ends Battle x3):

F_b C_bG_bD_bA_bE_bB_bF C G D A E B F# C# G# D#A#E#B#

To find the key signature of a **major key**, count *back one* from the tonic note - the seven notes *starting* with this one are those of the key. This example is D major:

F_b C_bG_bD_bA_bE_bB_bF C G (D) A E B F# C# G# D#A#E#B#

To find the key signature of a **minor key**, count *forward two* from the tonic note – the seven notes *ending* with this one are those of the key. This example is E minor:

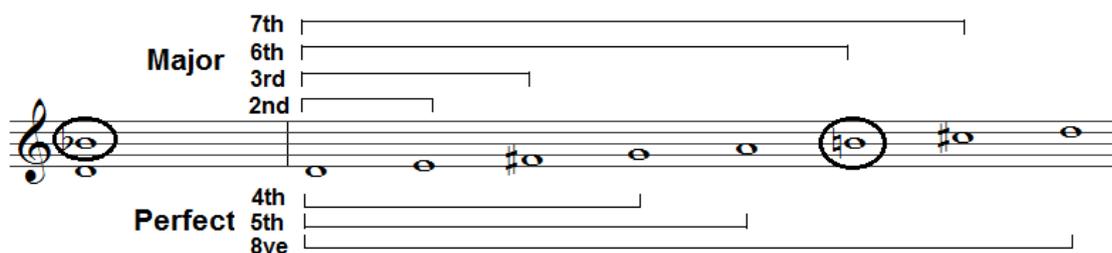
F_b C_bG_bD_bA_bE_bB_bF C G D A (E) B F# C# G# D#A#E#B#

- Harmonic minor: raise the seventh note of the scale (in this case D#) on the way up and down
- Melodic minor: raise the sixth and seventh note of the scale (C# and D#) on the way up and then lower them back on the way down

Basic Theory Quick Reference: Intervals

Method 1 (much better and practises understanding of keys and scales)

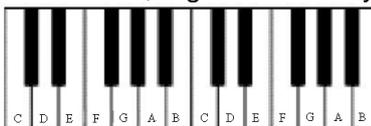
- Work out the interval size
 - In the example below D up to B = a sixth
- Write out a major scale starting on the **lower** note (you can save time by only going up as far as your upper note)
 - In the example below, a D major scale
- In a major scale the 4th, 5th and octave above the tonic are **perfect** and all the rest of the intervals are **major**
- If the upper note of your interval is *different* from that in the major scale, use the table below the main example to work out what type of interval you have:
 - In this case B^b is one semitone lower than B natural, so the interval is a **minor sixth**.



Compared to the major scale, the upper note is ...	4 th , 5 th , 8 ^{ve}	2 nd , 3 rd , 6 th , 7 th
... one semitone higher	augmented	augmented
... the same	perfect	major
... one semitone lower	diminished	minor
... two semitones lower	(Double diminished)	diminished

Method 2 (simpler but also dumber!)

- work out the interval between the two **letter names**. An interval from C to D, for example, will always be a second, regardless of any additional sharps and flats.



- count the number of semitones between the two notes:

Minor second	1 semitone	Perfect fifth	7 semitones
Major second	2 semitones	Minor sixth	8 semitones
Minor third	3 semitones	Major sixth	9 semitones
Major third	4 semitones	Minor seventh	10 semitones
Perfect fourth	5 semitones	Major seventh	11 semitones
[aug, 4 th OR dim. 5 th]	6 semitones		

- diminished intervals are **one semitone smaller** than the values given above
- augmented intervals are **one semitone larger** than the values given above

Inversions of intervals

An interval is inverted by moving the bottom note of the interval up an octave so that it is above what was previously the top note. It is called an inversion because by putting the bottom note at the top, you are turning the interval upside-down. The example below shows the common diatonic intervals and their inversions (notice that the two interval sizes always add up to 9).

Major 3rd Minor 6th Perfect 5th Perfect 4th Major 2nd Minor 7th

Below is a full list of intervals and their inversions:

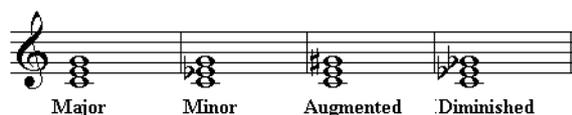
Major Seventh	Minor Seventh	Diminished Seventh	Augmented Sixth	Major Sixth	Minor Sixth	Augmented Fifth	Perfect Fifth	Diminished Fifth
Minor Second	Major Second	Augmented Second	Diminished Third	Minor Third	Major Third	Diminished Fourth	Perfect Fourth	Augmented Fourth

Basic Theory Quick Reference: Chords

Triad types

There are four types of triads (three-note chords) which are defined by the type of third and the type of fifth above the root as follows:

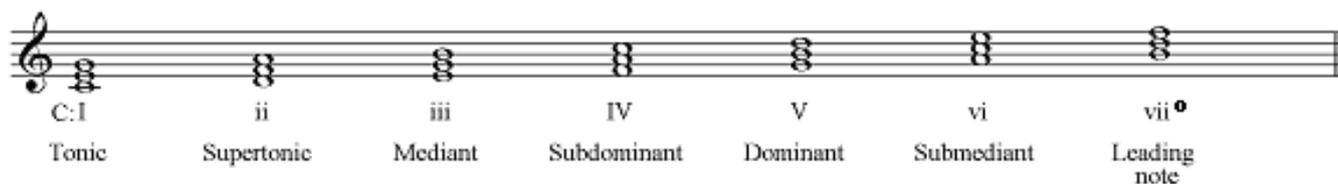
Triad	Type of third	Type of fifth
Major	Major	Perfect
Minor	Minor	Perfect
Augmented	Major	Augmented
Diminished	Minor	Diminished



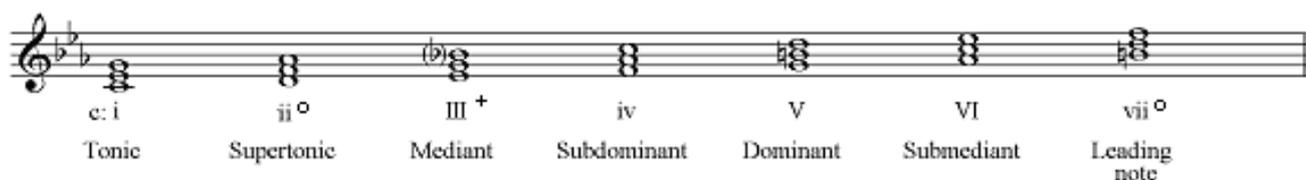
Labelling triads within a key

- The key is shown with an Arabic letter followed by a colon. Use upper case for major and lower case for minor (e.g. "A:" means A major and "g:" means G minor)
- Chords are labelled with Roman numerals as follows:
 - major chords in upper case (e.g. **I, IV**)
 - minor chords in lower case (e.g. **ii, vi**)
 - diminished chords in lower case with a superscript circle (e.g. **vii^o**)
 - augmented chords in upper case with a superscript plus sign (e.g. **III⁺**)

In a major key, **I, IV** and **V** are always major, chords **ii, iii** and **vi** are always minor and chord **vii^o** is diminished.



In a minor key, **i**, and **iv** are always minor, chord **V** would be minor but the leading note is sharpened in minor keys (in this case B natural in C minor) and this makes it major. Chords **III** and **VI** are usually major (although **III⁺** is augmented if the seventh is sharpened) and chords **ii^o** and **vii^o** are diminished.



Note that each degree of the scale has a name, after which the triad on that scale degree is known. Submediant, for example, means the third below the tonic.

Inversions of chords

Triads can be inverted by flipping the chord upside-down – i.e. moving the bottom note up an octave. Because triads consist of three notes, they can be inverted twice as in the example below.

The diagram shows a treble clef staff with three chords. Above the staff are three columns of labels: 'Root position', 'First inversion', and 'Second inversion'. Below the staff are three chords with their corresponding figured bass symbols: 'I', 'I⁶', and 'I₄⁶'. Arrows point from the labels to the notes in the first chord: 'Fifth' points to the top note (G), 'Third' points to the middle note (E), and 'Root' points to the bottom note (C).

- If the triad in its original position (arranged as a stack of two thirds) then the bottom note is the *root* and it is in **root position**.
- If the bottom note is the *third* of the chord, it is in **first inversion** (and a '6' is added to the Roman numeral – see figured bass guide below)
- If the bottom note is the *fifth* of the chord, it is **second inversion** (and a 6/4 is added to the Roman numeral).

The inversions of the C major triad can be rearranged without necessarily changing the inversion. For example, the first C major triad below is arranged so that the three notes are as close together as possible. A triad arranged like this is said to be in '**close position**'). In the second example below, the C major triad is spread out but the root is still at the bottom. It is the note at the bottom that determines the inversion. A C major triad with an E at the bottom, for example, is in first inversion however you arrange the two notes above the E, which is the third of the chord. Note that the figured bass remains the same regardless of whether the chord is in open or close position.

Two musical staves are shown. The first staff, labeled '1.', shows a C major triad in root position with notes C, E, and G stacked closely together. Below it is the text: 'C major, root position, close position'. The second staff, labeled '2.', shows a C major triad in root position with notes C, E, and G spread out across the staff. Below it is the text: 'C major, root position, open position'.

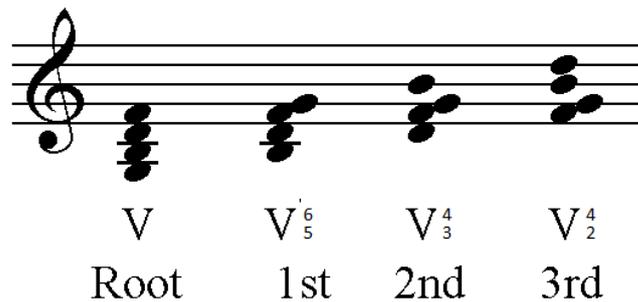
Seventh chords

The table below summarizes the main types of seventh chords and where they occur in a diatonic scale:

Common name for chord	Type of triad	Type of seventh	Occurs in major key on chords:	Occurs in minor key on chords:
<i>Major seventh</i>	major	major	I, IV	III*, VI
<i>Minor seventh</i>	minor	minor	ii, iii, vi	iv
<i>Dominant seventh</i>	major	minor	V	v
<i>Major-minor seventh</i>	minor	major		i
<i>Diminished seventh</i>	diminished	diminished		vii
<i>Half-diminished seventh</i>	diminished	minor	Vii	ii

* leading note is not usually sharpened on chord iii in minor

Seventh chords can be inverted in the same way as a triad, but because there is an extra note, there are now up to three possible inversions. See next page for explanation of figured bass.



TIP: if you want to know if a chord is based on a triad constructed from thirds, and which triad it is, you should try to rearrange it as a stack of thirds. In the example below, the root of the chord is C.

