

Chapter 1

Elements of Pitch

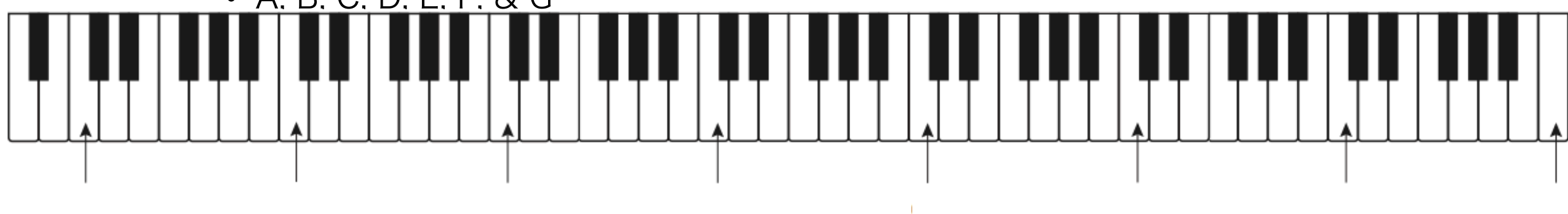
MUS 112

January 23, 2017

The Keyboard and Octave Registers

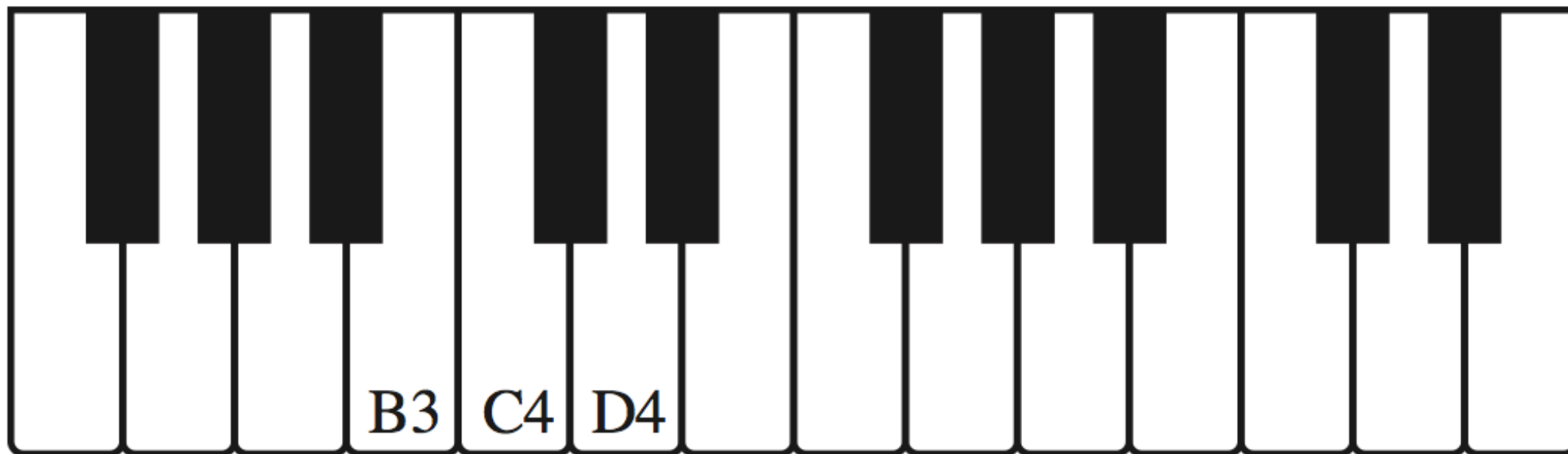
- Pitch

- Refers to the highness or lowness of a sound
- Pitches are named using the first seven letters of the alphabet
 - A. B. C. D. E. F. & G



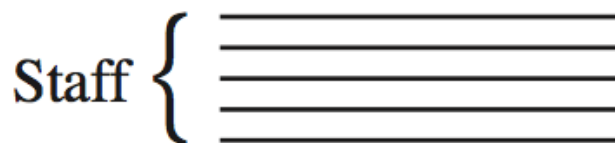
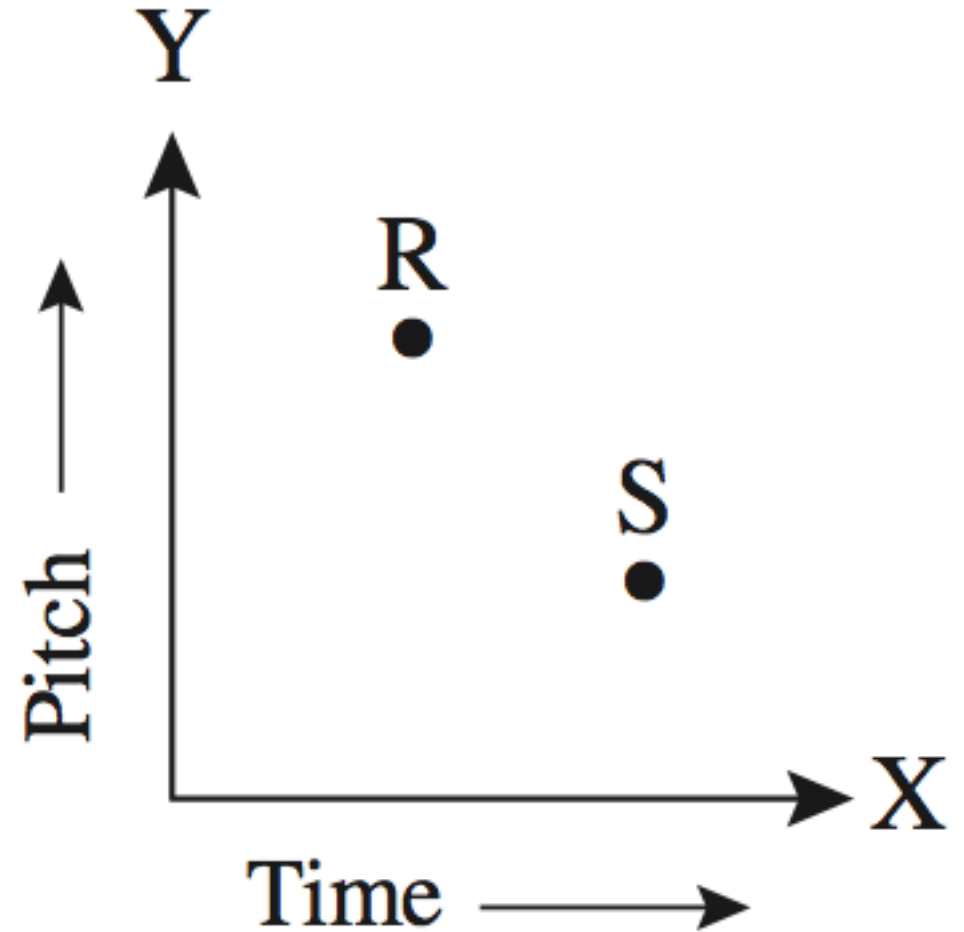
- From any note to the next note of the same name is called an **octave**
 - All pitches from one C up to, but not including, the next C are in the same octave register and have the same number following their pitch name. The number indicates the octave register.

Octave Register



Notation on the Staff

- Our system of musical notation is similar to a graph in which time is indicated on the X axis and pitch is shown on the Y axis.
- A **staff** is used in music to indicate the precise pitch desired.
 - Has five lines and four spaces
 - Staff can be extended with ledger lines



Notation on the Staff

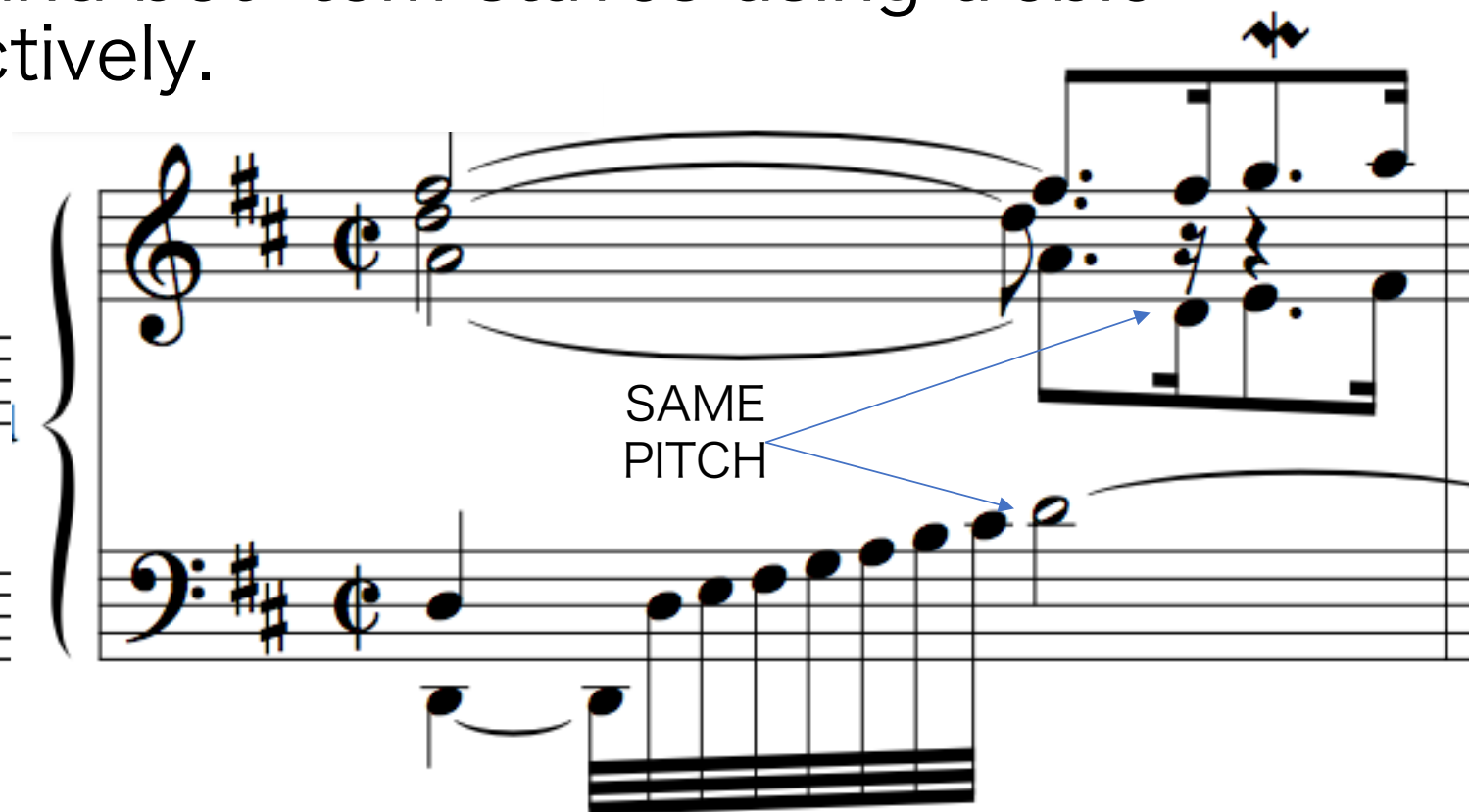
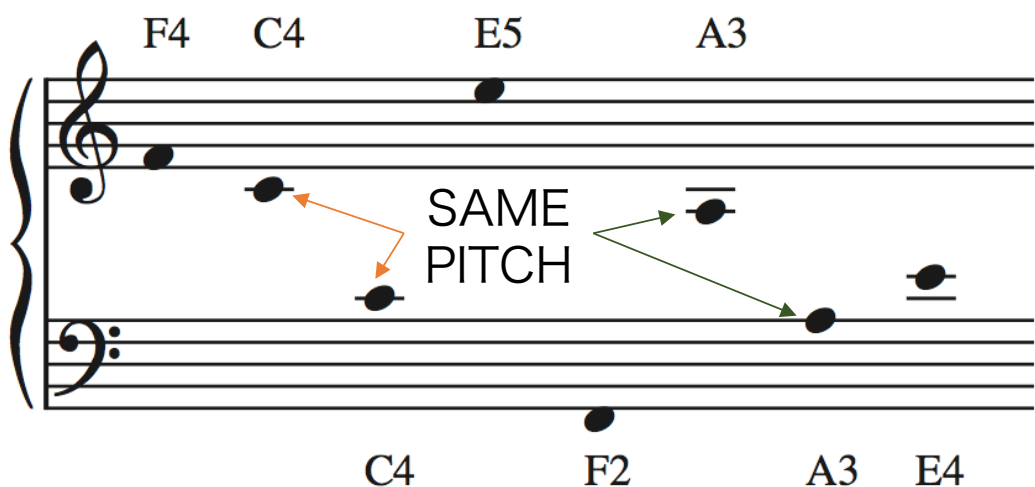
- A **clef** must appear on each staff so we know which lines and spaces indicate which pitch.
- Three common clefs:
 - Each is named for the pitch that it indicates





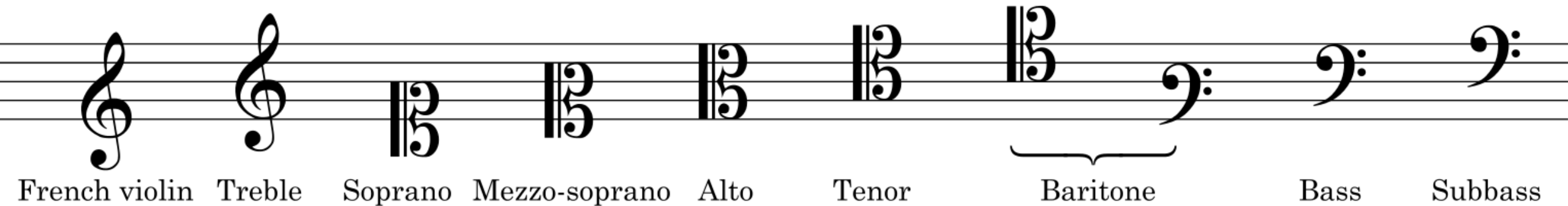
Notation on the Staff

- The **grand staff** is a combination of two staves joined by a brace, with the top and bottom staves using treble and bass clefs, respectively.
 - *Think Piano Music*



Notation on the Staff

- There are a ton more clefs:
 - Here are some, that you don't need to worry about:



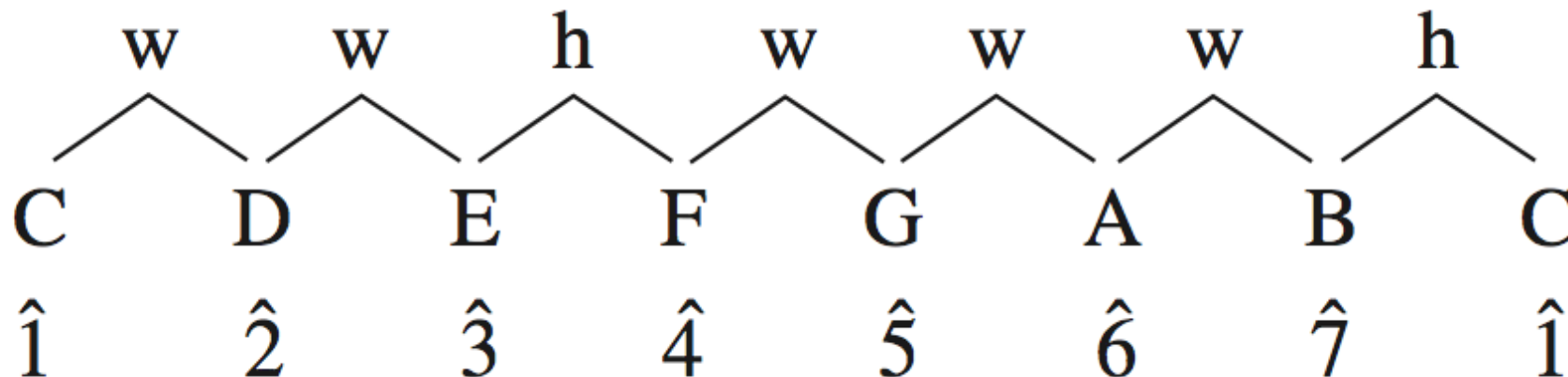
Scales

- Scale: a specific set of musical notes ordered by pitch
 - Ordered by increasing pitch = ascending scale
 - Ordered by decreasing pitch = descending scale
- A scale can be made up of any pitches, but we will focus on major and minor scales.
 - These scales form the basis of tonal harmony.
 - What do we mean by tonal????
 - We mean something rather specific>

- Tonal Harmony refers to the harmonic style of music composed during the period from about 1650 to about 1900. This would include such composers as Purcell, Bach, Handel, Haydn, Mozart, Beethoven, Schubert, Schumann, Wagner, Brahms, Tchaikovsky, and all their contemporaries.
- Much of today's popular music is based on tonal harmony, just as Bach's music was, which means that both types have a good deal in common
- 1st, both make use of a tonal center, a pitch class that provides a center of gravity.
- 2nd, both types of music make use almost exclusively of major and minor scales.
- 3rd, both use chords that are tertian in structure. Tertian means "built of thirds," so a tertian chord might be C–E–G, a non-tertian one C–F–B.
- 4th, *and very important*, is that the chords built on the various scale degrees relate to one another and to the tonal center in fairly complex ways. Because each chord tends to have more or less standard roles, or functions, within a key, this characteristic is sometimes referred to as functional harmony.

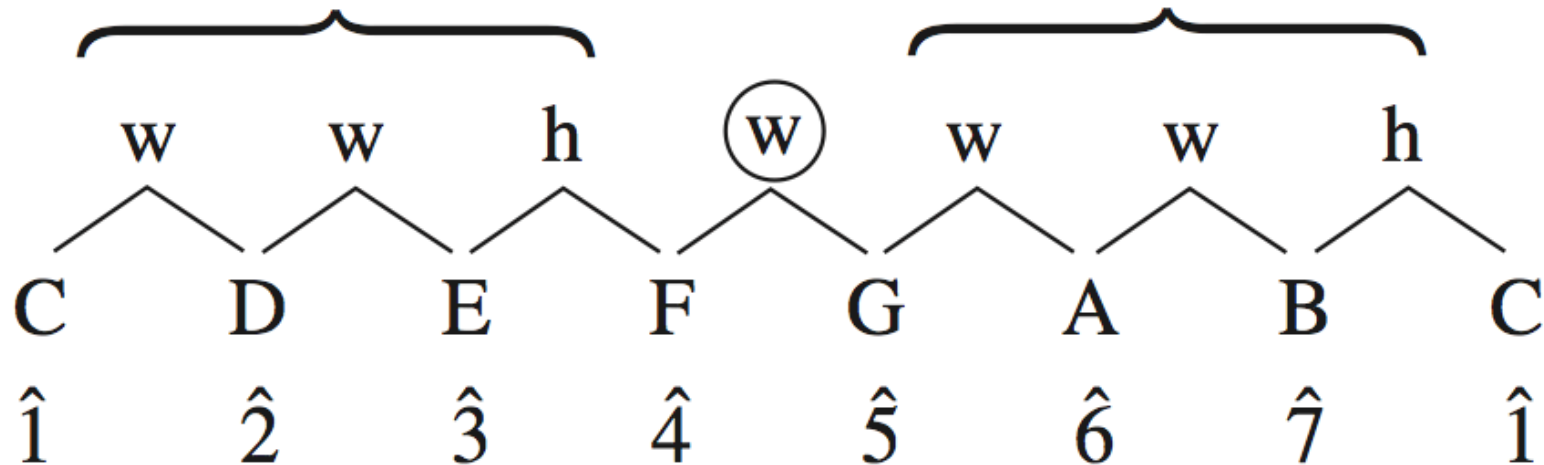
OK... Back to Scales

- Major and minor scales are specific patterns of whole steps and half steps
 - Half Step (h): the smallest musical interval
 - The distance from one key on the piano to the very next key
 - Whole Step (w): equal two half-steps
 - The next to smallest musical interval
- **Major Scale: w w h w w w h**
 - We find this pattern on the white keys of the piano when starting on C



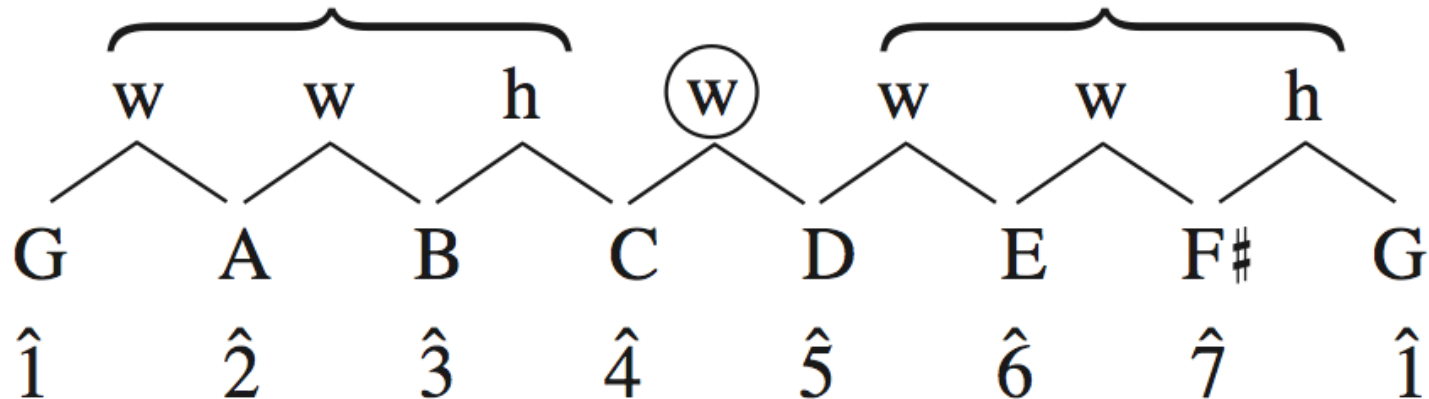
Major Scales

- You can see from this diagram that half steps in the major scale occur only between scale degrees $\hat{3}$ and $\hat{4}$ and $\hat{7}$ and $\hat{1}$.
- Notice also that the major scale can be thought of as two identical, four-note patterns separated by a whole step. These four-note patterns are called tetrachords.



Accidentals

- What happens if we start on G on ascending with only the white keys on the piano to the next G?
 - Do we have a major scale?
 - NO!!!
 - We need to alter (raise/lower) a pitch to make sure our interval pattern stays the same.



Accidentals

Symbol	Name	Effect
×	Double sharp	Raise a whole step
#	Sharp	Raise a half step
♮	Natural	Cancel a previous accidental
♭	Flat	Lower a half step
♭♭	Double flat	Lower a whole step

Key Signatures

- Each major scale has an associated key signature that indicates the accidentals required to produce the correct pattern of notes starting on ^1.
- **Key signature**: a pattern of sharps or flats that appears at the beginning of a staff and indicates that certain notes are to be consistently raised or lowered.

Key Signatures

- There are seven major keys with sharps in the key signature:

The image displays a musical staff with seven measures, each representing a major key with a specific number of sharps. The keys are G major (1 sharp), D major (2 sharps), A major (3 sharps), E major (4 sharps), B major (5 sharps), F# major (6 sharps), and C# major (7 sharps). The notation is presented in a grand staff with treble and bass clefs, showing the key signature for each key.

Key Signature	Number of Sharps	Key Name
1 sharp	1	G major
2 sharps	2	D major
3 sharps	3	A major
4 sharps	4	E major
5 sharps	5	B major
6 sharps	6	F# major
7 sharps	7	C# major

- Notice that as we add sharps we also retain the sharps
 - F C G D A E B
 - We call this the “order of sharps”

Key Signatures

- There are seven major keys with flats in the key signature:

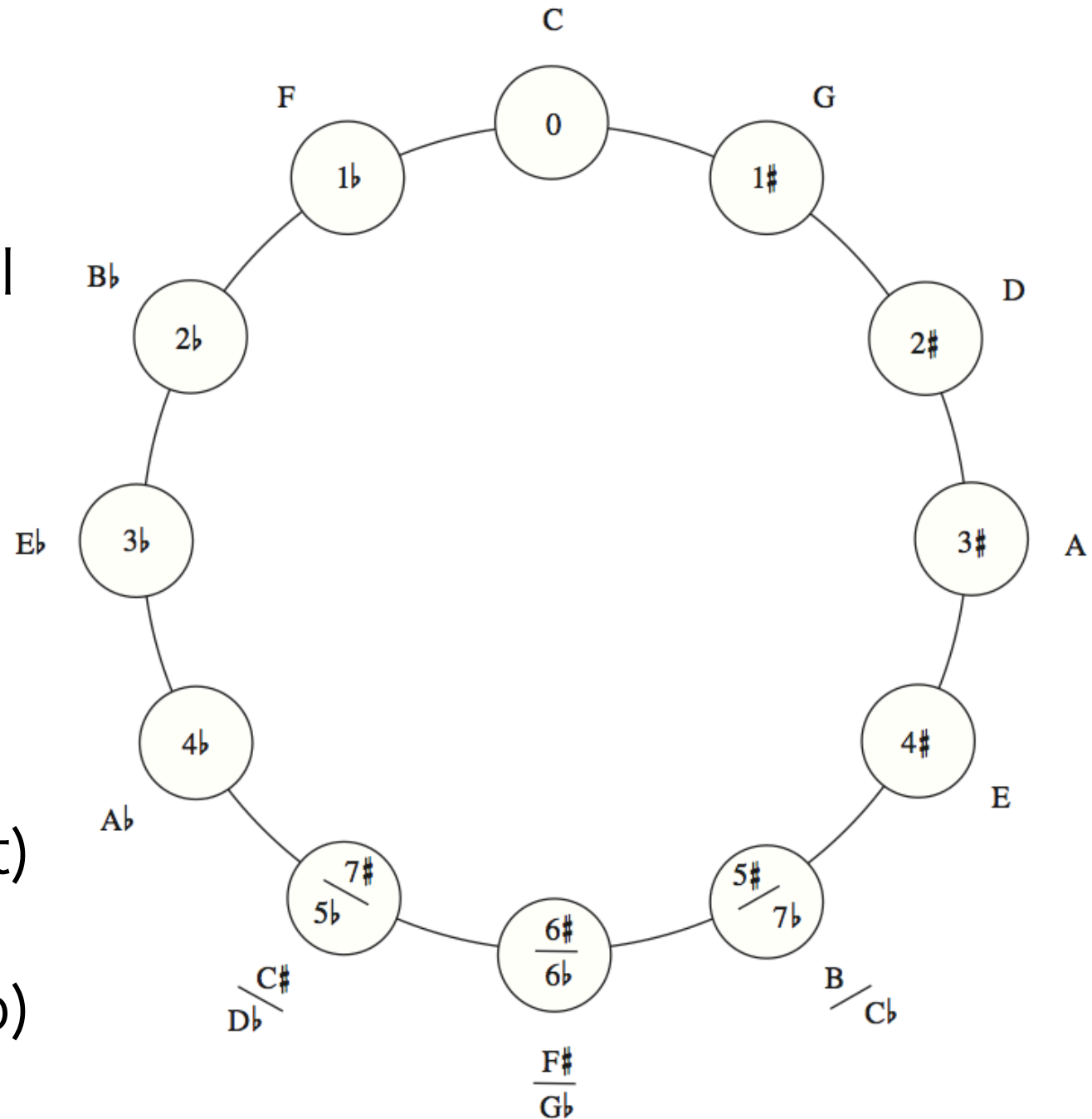
The image displays seven major keys with flats, each represented by a grand staff (treble and bass clefs) with its key signature. The keys are arranged in a row, separated by vertical lines. Below each staff, the number of flats is indicated.

Key Signature	Number of Flats
F major	1 flat
B \flat major	2 flats
E \flat major	3 flats
A \flat major	4 flats
D \flat major	5 flats
G \flat major	6 flats
C \flat major	7 flats

- Notice that as we add flats we also retain the sharps
 - B E A D G C F
 - We call this the “order of flats”

Circle of Fifths

- Reading clockwise, you will see that each new key begins on $\wedge 5$ of the previous key.
- counterclockwise, each new key begins on $\wedge 4$ of the previous one.
- To get a key a fifth above, add a sharp (remove a flat)
- To get a key a fifth below, add a flat (remove a sharp)



Key Signatures & You

- You need to:
 - memorize all key signatures
 - memorize the order of flats
 - memorize the order of sharps
 - Be able to write all key signatures on all clefs
 - Be able to immediately recognize all key signatures
- Luckily for you, the internet has anything you would ever need!
 - <http://www.musictheory.net/exercises>

More Scales: The Minors

- There are three minor scale patterns all musicians need to know.
 - Natural Minor: like a major scale with lowered $\hat{3}$, $\hat{6}$, and $\hat{7}$
 - w h w w h w w
 - Harmonic Minor: Natural minor scale with a raised $\hat{7}$
 - w h w w h $+2$ h
 - Melodic Minor: has an ascending form and a descending form
 - The ascending form is like natural minor with a raised $\hat{6}$ and $\hat{7}$ or as major with lowered $\hat{3}$.
 - w h w w w w h
 - The descending form is identical to the natural minor

Minor Scales

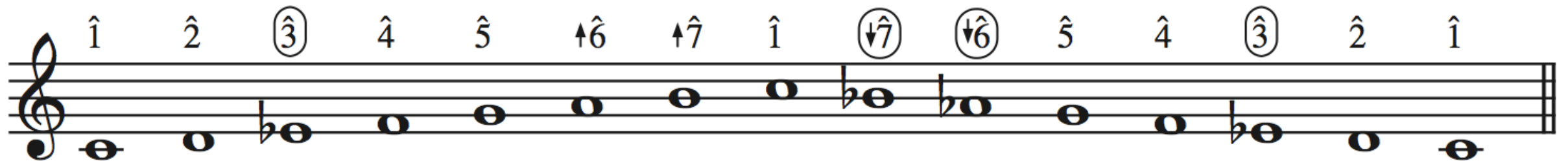
Natural minor



Harmonic minor



Melodic minor



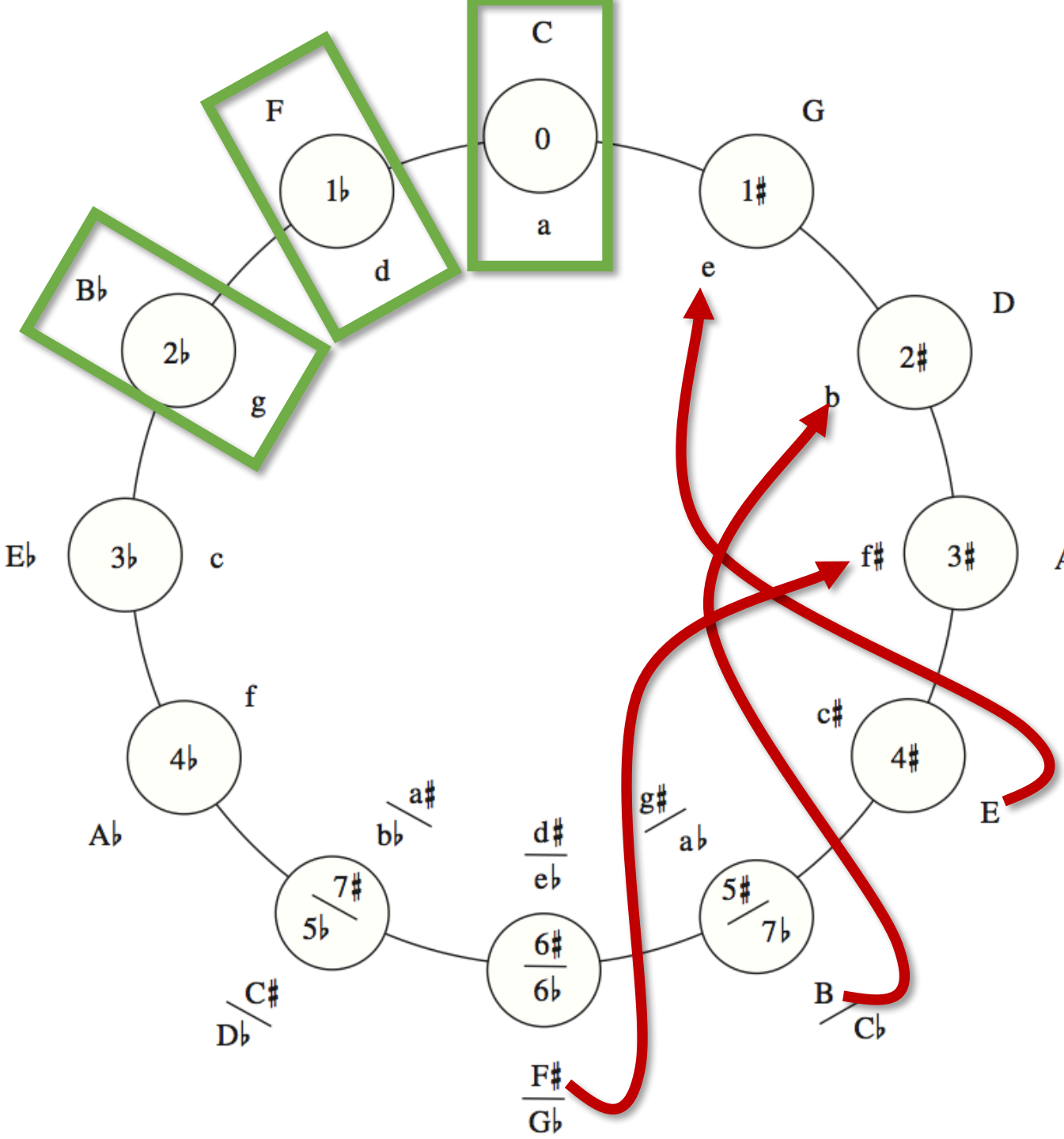
Minor Key Signatures

- Minor key signatures conform to the natural minor scale, no matter which minor scale type is actually in use.
- Let's look at f# minor
 - Which accidentals are required to make F# minor?
 - Which *major* key signature has these accidentals?
- f# minor and A major are relative keys because they share the same key signature.
 - The relative major of any minor key starts on $\hat{3}$ of the minor scale, and the relative minor of any major key begins on $\hat{6}$ of the major scale.
- Major and minor scales that share $\hat{1}$ are parallel keys
 - Ex. F# Major and f# minor

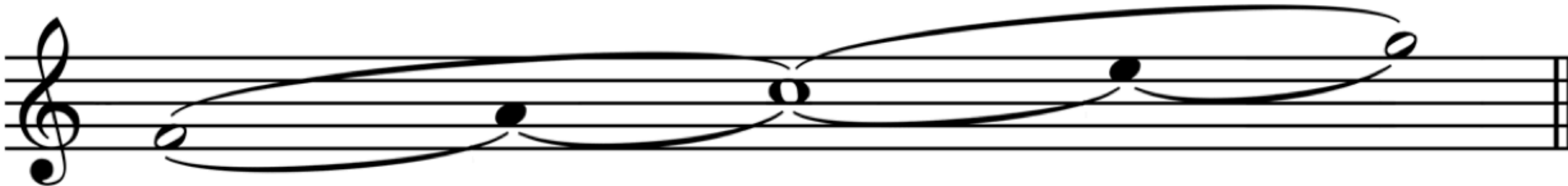
All the Key Signatures

- Relative Keys

- Parallel Keys

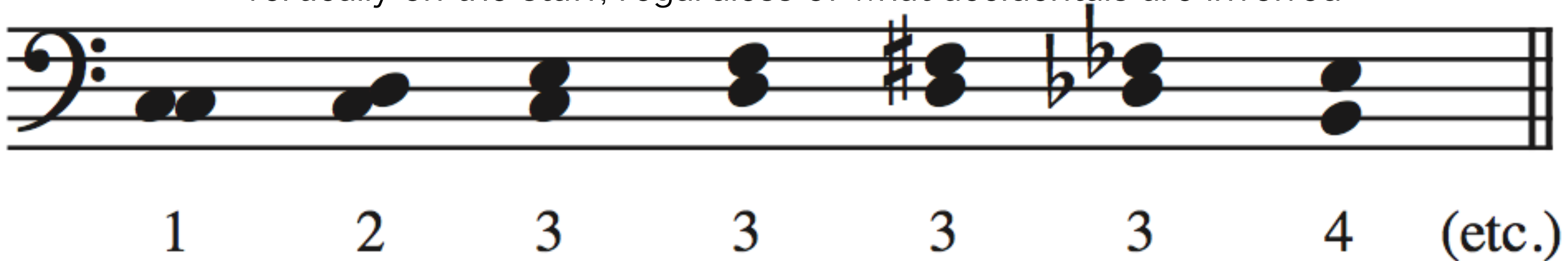


Scale Degree Names



Intervals

- Interval: the measurement of the distance in pitch between two notes.
- harmonic interval: results when two notes sound simultaneously
- melodic interval: occurs when two notes are played successively
- There are two parts to *every* interval name: the numerical name and the modifier that precedes it
 - the numerical name is a measurement of how far apart the notes are vertically on the staff, regardless of what accidentals are involved



Intervals

- Numerical intervals

- Unison (instead of 1st)
- 2nd
- 3rd
- 4th
- 5th
- 6th
- 7th

Simple intervals

- Octave (instead of 8th)

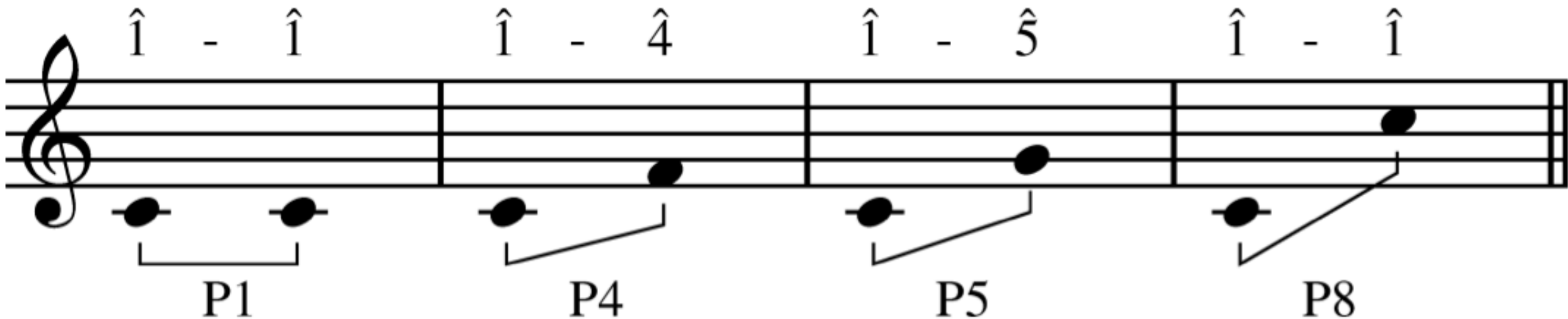
- 9th
- 10th
- 12th
- Etc...

Compound intervals

Interval Modifiers

- Perfect

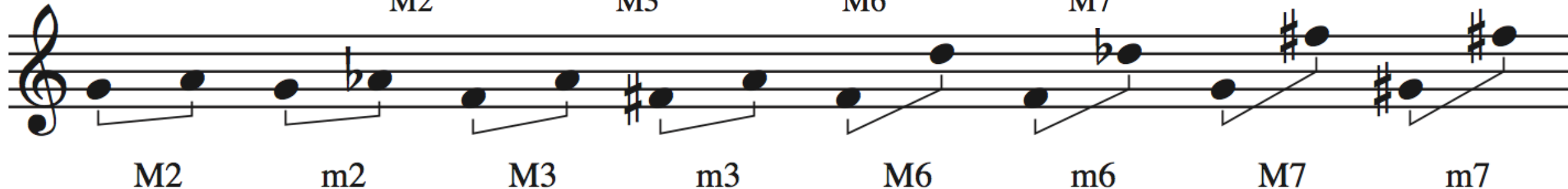
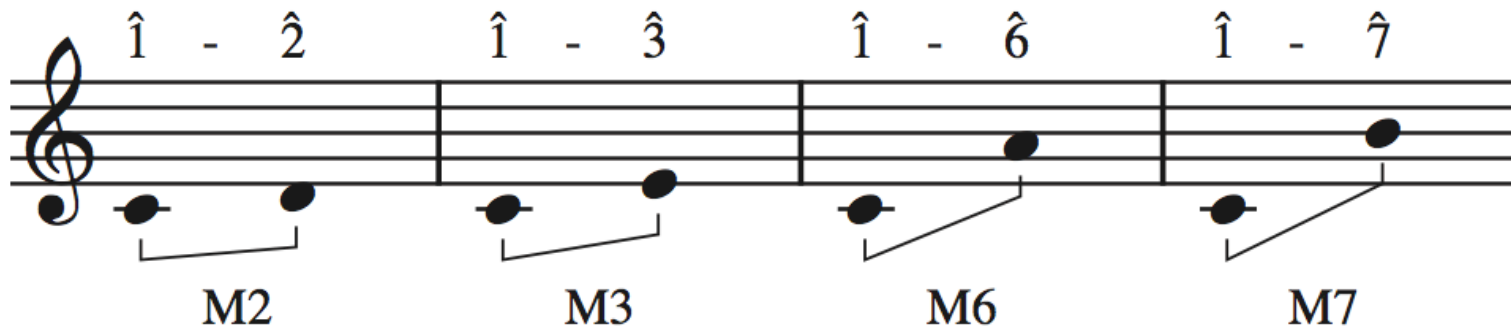
- Refers to Unisons, 4ths, 5ths, 8ves, and their compounds (ex. 11ths)



Interval Modifiers

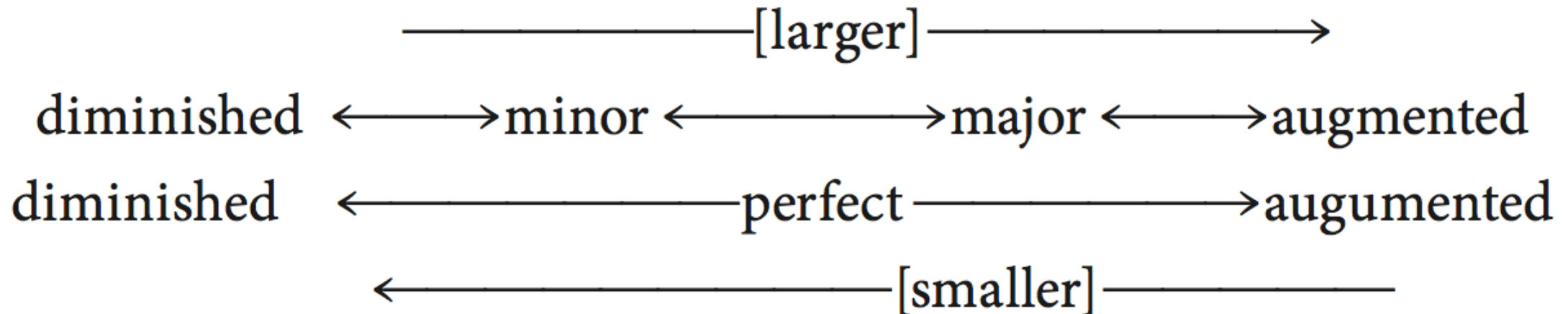
- Major/minor

- Only used in conjunction with 2nds, 3rds, 6ths, and 7ths
 - The intervals formed by $\hat{1}-\hat{2}$, $\hat{1}-\hat{3}$, $\hat{1}-\hat{6}$, and $\hat{1}-\hat{7}$ in the major scale are all major intervals
 - If we lessen a major interval by a half-step it becomes a minor interval



Augmented and Diminished Intervals

- If a perfect or a major interval is made a half step larger without changing the numerical name, the interval becomes augmented (abbreviated +)
- If a perfect or a minor interval is made a half step smaller without changing its numerical name, it becomes diminished (abbreviated °)



More on Intervals

- There is no such thing as a diminished unison.
 - Why?
- Doubly augmented and doubly diminished intervals are possible, but they seldom occur.
 - Let's make an example of a doubly augmented 3rd
- Tritone is a term used for the +4 or its enharmonic equivalent, the $^{\circ}5$.
- Enharmonic: something that sounds the same but is spelled differently
 - Notes: and Fb
 - Keys: C# Major and Db Major
 - Intervals: $^{\circ}4$ and M3

Inversion of Intervals

- We can invert simple intervals
 - Transpose one the notes by an octave to reverse the verticle order of the notes.
 - When we invert simple intervals 2 things predictably happen:
 - If we subtract the starting numeric name from 9 we get the ending numeric name
 - A 2nd becomes a 7th and vice versa
 - A 3rd becomes a 6th and vice versa
 - A 4th becomes a 5th and vice versa
 - The modifier also inverts (except for perfect intervals)
 - Major becomes minor, and vice versa
 - Augmented becomes diminished and vice versa

Consonant and Dissonant Harmonic Intervals

- consonant and dissonant can be defined roughly as meaning pleasing to the ear and not pleasing to the ear, respectively
- For now the following will suffice
 - Consonant
 - major and minor 3rds and 6ths and perfect 5ths and 8ves
 - Dissonant
 - All other harmonic intervals, including all augmented and diminished intervals, are dissonant. An exception is the P4, which is considered dissonant in tonal music only when it occurs above the lowest voice
- This is based off what composers of tonal music (1650-1900) traditionally wrote, our modern ears are accustomed to a much wider range of consonance.

Intervals & You

- You need to:
 - Know all possible intervals
 - Be able to immediately recognize any intervals
 - Even the crazy ones
- Luckily for you, the internet has anything you would ever need!
 - <http://www.musictheory.net/exercises>

