

Teaching Secondary Dominant Triads and 7ths through the Circle of 5ths

Dr. Paula J. Telesco

Introduction: There are different ways to teach secondary dominants. The most common approach seems to be asking students to think in the secondary key (with its concomitant sharps or flats), spelling the dominant chord in that secondary key, and then adding the necessary accidentals to have that chord fit in the primary key. In other words, starting in C major, if one wants to spell a V/V, one has to first determine the key of V (G), its key signature (one sharp), and its dominant chord (D). To notate that in C major, one then has to add an F[#] to the chord. Clearly, as keys with more sharps or flats are introduced, this mental juggling of keys and key signatures can become more difficult. In fact, I have found that the topic of secondary dominants is where the whole house of cards begins to collapse if students have any weak spots in terms of major and minor keys, key signatures, triads, etc.

One alternative and complementary approach is to begin by introducing briefly the concept of secondary dominants, and then teaching them as altered diatonic chords. This approach works very well if students have already learned cadences, diatonic seventh chords and the diatonic circle of fifths in major and minor keys, which most students will have by the time they get to secondary dominants.

To begin, one should review the Perfect Authentic Cadence (PAC), which consists of the major V chord (or V⁷) moving to I. This progression entails the critical root movement $\uparrow P4th/\downarrow P5th$ ($\hat{5}-\hat{1}$). That root movement creates the strongest harmonic progression in tonal music and is a defining characteristic of the PAC.

Next, the chordal circle of 5ths should be reviewed. This circle of 5ths arranges the chords such that each chord progresses to the next by the root movement of $\uparrow P4th/\downarrow P5th$. In this way, each pair of chords in this harmonic sequence mimics to a greater or lesser degree the strong V–I motion. Thus, almost any chord in the circle of 5ths can be altered to become a major triad or a Mm7 chord, and thereby become the dominant of the chord that follows it.

The diagrams below provide strong visual reinforcement for students as they learn this concept, lessening the mental juggling that otherwise has to take place when attempting to spell a secondary dominant in some given key. Whatever key the music is in, if the students can spell the diatonic chords, they can transform those chords into secondary dominants with one or two chromatic alterations.

It should be stressed that much music employs secondary dominants, either individually, or as segments of the circle of 5ths. Sometimes just small segments of the circle are used, and sometime the music progresses through the entire progression.

The following student materials, beginning on the next page, demonstrate this approach. Following the explication of this topic are a number of worksheets from which instructors can pick and choose according to their students needs. There are three sets of exercises. One asks students to spell ii⁷/ii^{ø7} chords in various major and minor keys, then alter them to become a V⁷/V (the most commonly found secondary dominants); another asks students to follow the model laid out in the handout, using the circle of 5ths and altering triads to transform them into secondary dominant triads; and the third asks students to follow the model, altering triads and 7ths to transform them into secondary dominant seventh chords. If the instructor wishes, these final secondary dominant 7th chord exercises can be assigned as extra credit, used with more advanced students, or given at a later date. And, of course, instructors can make up more exercises following any of these models as they feel appropriate.

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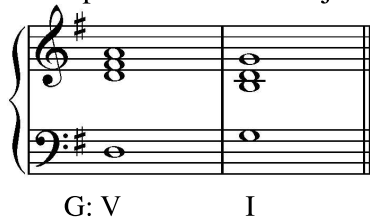
I. Secondary Dominant Triads

In any major or minor key, the dominant and tonic chords often function together as a pair, $V^{(7)}-I$, either to create a strong cadential motion, like a Perfect Authentic Cadence (PAC), or simply to clarify or reinforce the tonic chord. The root movement from any dominant to its tonic is $\uparrow P4th/\downarrow P5th$. That root movement creates the strongest harmonic progression in tonal music and is a defining characteristic of the PAC.

In order for a chord to have dominant function, it must be a major triad or a $Mm7$,¹ and in order for a chord to have a tonic function, it must be a major or minor triad. There are no diminished or augmented keys, so there can be no diminished or augmented tonics. In a major key, the triad built on the dominant note ($\hat{5}$) is major (V), and the 7th chord is Mm (V^7). In a minor key, the triad built on $\hat{5}$ is minor (v); a leading tone must be added to make it major (V). The 7th chord will then be Mm (V^7).

We say that the primary dominant in any key *tonicizes* the tonic chord: that is, it makes the tonic sound like tonic. As shown in Example 1, D major is the dominant and G major is the tonic: the D major chord tonicizes G:

Example 1: V–I in G major



This G major chord also fits diatonically in several other keys as something other than tonic, as for example, V in the key of C major. Yet it can still be tonicized, or made to sound like a temporary (even fleeting) tonic if it is preceded by its dominant D major chord. Since D major does not fit diatonically in the key of C, it must be *borrowed* from the key of G.

A dominant chord that is borrowed from one key and used in another is called a *secondary dominant*. In the C major example below, G major remains the primary dominant; the borrowed D major chord is a secondary dominant, analyzed as V/V . This process of making some diatonic chord in a key sound like a temporary tonic is called *tonicization*. This is shown in Example 2:

¹ The notation Mm refers to a major-minor 7th chord; mm refers to a minor-minor 7th chord; MM refers to a major-major 7th chord; and dm refers to a diminished-minor 7th chord, also referred to as a half-diminished 7th chord.

Example 2: Tonicization of V in C major

C: V/V V

One helpful visual strategy for learning about secondary dominants is through the chordal diatonic circle of 5ths, shown in the diagram below. The circle of 5ths is an arrangement of all the diatonic chords in a key, beginning and ending on the tonic chord, with every chord progressing to the next by a root movement of $\uparrow 4\text{th}/\downarrow 5\text{th}$.

Much music employs secondary dominants, either individually, or as segments of the circle of 5ths. Sometimes just small segments of the circle are used, and sometimes the music progresses through the entire circle. Several examples of such pieces are included below. You should play through these examples—you will almost certainly recognize these progressions as ones you have heard many times, even though you may not have known how to label them.

I. Major Keys

Examples 3 and 4 illustrate the major-key diatonic circle of 5ths, a harmonic sequence. The root movement from one chord to the next, from start to finish, is $\uparrow P4\text{th}/\downarrow P5\text{th}$, with one exception: there is one root movement of $\uparrow A4\text{th}/\downarrow d5\text{th}$, from IV–vii^o ($\hat{4}-\hat{7}$), as shown in Example 1. Excluding the IV–vii^o progression, we can think of this arrangement of chords as a series of potential V–I relationships, mimicking the final V–I relationship at the end of the progression:

Example 3: C Major Circle of 5ths

I IV vii° iii vi ii V I

Example 4: Mozart, Piano Sonata in C Major, K. 545, mvt. 1

G: I⁶ IV vii^{o6} iii vi⁶ ii V⁶ I

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Consequently, any triad in the circle of 5ths can be altered to become the secondary dominant of the chord that follows it as long as it meets these two criteria:

- (1) The root movement from the potential dominant to its potential tonic chord must be $\uparrow P4th/\downarrow P5th$
- (2) The potential dominant must be a major triad or Mm7 chord

And, every chord in the progression may be tonicized, as long as it meets this single criterion:

- (1) As a potential tonic, it must be a major or minor triad, because only major and minor triads can be tonic chords (vii° , ii° , and III^+ can never be tonicized, whether in a major or minor key).

Therefore:

- (1) With the exception of IV (which moves to vii° by the root movement $\uparrow A4th/\downarrow d5th$), every chord in the progression is potentially the dominant of the chord that follows it
- (2) With the exception of vii° , every chord in the progression is a potential tonic, capable of being tonicized.
- (3) All secondary dominants are altered diatonic chords

As shown in Example 5, the V chord is preceded by the ii chord. Since the root movement from ii to V is $\uparrow P4th/\downarrow P5th$, ii is a potential secondary dominant, a V/V. Because ii is a minor chord, comprising scale degrees $\hat{2} \hat{4} \hat{6}$ (*re fa la*), the third needs to be raised by a chromatic semitone, from $\hat{4}/fa$ to $\sharp\hat{4}/fi$, to transform it into a secondary dominant, a V/V:

$$ii = \hat{2} \hat{4} \hat{6} \text{ (re fa la)} \qquad V/V = \hat{2} \sharp\hat{4} \hat{6} \text{ (re **fi** la)}$$

Thus, a V/V chord is an altered ii chord, and the V/V–V progression now mimics the strong V–I diatonic progression, as shown in Example 5:

Example 5: ii altered to become a V/V

I IV vii° iii vi ii V/V V I

We can continue backing up in the circle of 5ths to create additional secondary dominants. Any of the minor triads (ii, vi, ii) can be transformed into secondary dominants of the triads that follows them with just one alteration: raise the third by a chromatic half step to make the triad major. In Example 6, raising the third of vi from $\hat{1}/do$ to $\sharp\hat{1}/di$ transforms the vi chord into the V/ii:

$$vi = \hat{6} \hat{1} \hat{3} \text{ (la do mi)} \qquad V/ii = \hat{6} \sharp\hat{1} \hat{3} \text{ (la **di** mi)}$$

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Example 6: vi altered to become a V/ii

I IV vii° iii vi V/ii ii V I

Example 7 shows the iii chord altered by raising the third from $\hat{5}/sol$ to $\# \hat{5}/si$, to become the V/vi:

$$\text{iii} = \hat{3} \hat{5} \hat{7} \text{ (mi sol ti)} \qquad \text{V/vi} = \hat{3} \# \hat{5} \hat{7} \text{ (mi si ti)}$$

Example 7: iii altered to become a V/vi

I IV vii° iii V/vi vi ii V I

Since vii° is a diminished triad, two alterations are necessary to transform it into a V/iii: both the third and 5th have to be raised by a chromatic semitone, from $\hat{2}/re$ to $\# \hat{2}/ri$; and from $\hat{4}/fa$ to $\# \hat{4}/fi$. This is shown in Example 8:

$$\text{vii}^\circ = \hat{7} \hat{2} \hat{4} \text{ (ti re fa)} \qquad \text{V/iii} = \hat{7} \# \hat{2} \# \hat{4} \text{ (ti ri fi)}$$

Example 8: vii° altered to become a V/iii

I IV vii° V/iii iii vi ii V I

As stated above, the vii° chord cannot itself be tonicized because it is diminished, so IV cannot function as a secondary dominant in the major-key circle of 5ths.

Backing up one last time, we arrive at the first chord in the circle of 5ths, the tonic. The tonic is in effect always the secondary dominant of IV: it is a major triad, and it moves to IV by the root movement $\uparrow P4\text{th}/\downarrow P5\text{th}$. However, its strong tonic function supersedes its function as a V/IV, except perhaps in a circle of 5ths. But when 7ths are added, as shown later in this handout, the tonic chord loses its tonic function, and takes on a strong secondary dominant function.

Example 9 shows each eligible diatonic chord (i.e., excluding IV) being altered to become the secondary dominant of the chord that follows it:

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Example 9: All Eligible Diatonic Chords Transformed Into Secondary Dominants

I IV vii° V/iii iii V/vi vi V/ii ii V/V V I
=V/IV

Finally, one can have a major-key *chromatic* circle of 5ths, where all the eligible diatonic chords are replaced by their secondary dominant counterparts, as shown in Example 10.

Example 10: C Major Chromatic Circle of 5ths

I IV V/iii V/vi V/ii V/V V I
=V/IV

2. Minor Keys

In minor keys, the first thing to remember is that to create the *primary* dominant chord, a leading tone must be added. Then, as in major keys, all root movements are $\uparrow P4th/\downarrow P5th$, with one exception: there is a root movement of $\uparrow A4th/\downarrow d5th$ from VI–ii° ($\hat{6}-\hat{2}$). Excluding this VI–ii° progression, we can think of this arrangement of chords as a series of potential V–I relationships, mimicking the final V–I relationship at the end of the progression, just as in major keys. Examples 11 and 12 illustrates the minor-key diatonic circle of 5ths.

Example 11: C Minor Diatonic Circle of 5ths

i iv VII III VI ii° V i
 $\hat{6}-\hat{2} = A4/d5$

Example 12: Handel, Passacaglia in G minor, from Suite VII

g: i iv° VII III VI ii° V i

As in major, any triad in the minor-key circle of 5ths can be transformed into the secondary dominant of the chord that follows it as long as it meets these same two criteria:

- (1) The root movement from the potential dominant to its object chord must be $\uparrow P4th/\downarrow P5th$
- (2) The potential dominant must be a major triad or Mm7 chord

And, every chord in the progression may be tonicized, as long as it meets this single criterion:

- (1) As a potential tonic, it must be a major or minor triad.

Therefore:

- (1) With the exception of VI (which moves to ii° by $\uparrow A4th/\downarrow d5th$), every chord in the progression is potentially the dominant of the chord that follows it
- (2) With the exception of ii° , every chord in the progression is a potential tonic, capable of being tonicized.
- (3) All secondary dominants are altered diatonic chords

As in major, the supertonic chord (ii°) precedes V, and the root movement is $\uparrow P4th/\downarrow P5th$. Because ii° is a diminished chord in a minor key, comprising scale degrees $\hat{2} \hat{4} \downarrow \hat{6}$ (*re fa le*), both the third and fifth need to be raised by a chromatic semitone, from $\hat{4}/fa$ to $\sharp\hat{4}/fi$, and $\downarrow\hat{6}/le$ to $\uparrow\hat{6}/la$, to transform ii° into a V/V secondary dominant (shown in Example 13):²

$$ii^\circ = \hat{2} \hat{4} \downarrow \hat{6} \text{ (re fa le)} \qquad V/V = \hat{2} \sharp\hat{4} \uparrow\hat{6} \text{ (re fi la)}$$

Example 13: ii° altered to become a V/V

i iv VII III VI ii° V/V V i

The ii° chord cannot itself be tonicized, both because it is a diminished triad and the root motion from the preceding VI chord is $\uparrow A4th/\downarrow d5th$. So VI is not eligible to become a secondary dominant.

Notice that in minor there are three major chords in a row, each a $\uparrow P4th/\downarrow P5th$ from the others. Thus, without any alteration at all, III is the secondary dominant of VI, and VII is the secondary dominant of III, as shown in Examples 14 and 15. When 7ths are added, those secondary functions become much more pronounced, as will be shown later in this handout.

² Scale degrees preceded by a downward arrow refer to those scale degrees as found in the natural form of the minor scale. $\downarrow\hat{3} \downarrow\hat{6} \downarrow\hat{7}$ are a m3, m6, and m7 above tonic, respectively (*me*, *le* and *te*). Upward arrows refer to those scale degrees as found in major keys, where they are a M3, M6, and M7 above tonic (*mi*, *la*, and *ti*).

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Example 14: III = V/VI

i iv VII III VI ii° V i

= V/VI

Example 15: VII = V/III.

i iv VII III VI ii° V i

= V/III

Backing up one more chord brings us to the minor iv chord, comprising scale degrees $\hat{4} \downarrow \hat{6} \hat{1}$ (*fa le do*). By raising the third from $\downarrow \hat{6}/le$ to $\uparrow \hat{6}/la$, iv becomes the secondary dominant of VII (shown in Example 16):

$$iv = \hat{4} \downarrow \hat{6} \hat{1} \text{ (fa le do)} \qquad V/VII = \hat{4} \uparrow \hat{6} \hat{1} \text{ (fa **la** do)}$$

Example 16: iv altered to become a V/VII

i iv V/VII VII III VI ii° V I

Backing up one final time brings us to the tonic chord, the first chord in the series. Unlike in a major key, an unaltered minor tonic chord is not the secondary dominant of iv because it is a minor triad. Raising the third from $\downarrow \hat{3}/me$ to $\uparrow \hat{3}/mi$, transforms it into the V/iv. This alteration also helps to override its tonic function and strengthen its role as a secondary dominant (shown in Example 17):

$$i = \hat{1} \downarrow \hat{3} \hat{5} \text{ (do me sol)} \qquad V/iv = \hat{1} \uparrow \hat{3} \hat{5} \text{ (do **mi** sol)}$$

Example 17: i altered to become a V/iv

i V/iv iv VII III VI ii° V i

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Example 18 shows each eligible diatonic chord being transformed into the secondary dominant of the chord that follows it. Remember:

- (1) VII and III are already the secondary dominants of the chords that follow them, so they need no alteration
- (2) The supertonic chord is diminished, so VI cannot become a secondary dominant and tonicize it.

Example 18: All Eligible Diatonic Chords Transformed Into Secondary Dominants

i V/iv iv V/VII VII III VI ii° V/V V i
= V/III = V/VI

Finally, we can have a minor-key chromatic circle of 5ths, where all eligible diatonic chords can become (or already are) the secondary dominant of the chord that follows, as shown in Example 19:

Example 19: C Minor Chromatic Circle of 5ths

V/iv V/VII V/III V/VI VI V/V V i

All of the examples above show the derivation of secondary dominants from their diatonic counterparts in both major and minor keys. While secondary dominant triads are common in music, the majority of secondary dominants you will encounter are 7th chords rather than triads. We will look at those next.

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*II. Secondary Dominant 7ths**1. Major keys*

Adding 7ths to potential secondary dominant triads makes their secondary dominant function far more robust. And, in fact, most secondary dominants found in music are 7th chords rather than triads. First, let's review the diatonic 7th chords in the C major circle of 5ths, shown in Example 20:

Example 20: Diatonic 7th Chords in the C Major Circle of 5ths

I^{M7} IV^{M7} vii^{ø7} iii⁷ vi⁷ ii⁷ V⁷ I

Note that four diatonic 7th chords (besides V⁷ itself) have minor 7ths (vii^{ø7}, iii⁷, vi⁷ and ii⁷), and two have major 7ths (I and IV).³ A secondary dominant 7th chord must be a Mm7 chord, so to transform those chords into secondary dominants, each must become a Mm7. The mm7 chords, iii⁷, vi⁷ and ii⁷, need just one alteration: raise the 3rd by a chromatic half step to make the triad major. The resulting chords will be dominant 7ths, and therefore the secondary dominants of the chords that follow them, as shown in Example 21:

iii ⁷ = $\hat{3} \hat{5} \hat{7} \hat{2}$ (<i>mi sol ti re</i>)	V ⁷ /vi = $\hat{3} \hat{\sharp 5} \hat{7} \hat{2}$ (<i>mi si ti re</i>)
vi ⁷ = $\hat{6} \hat{1} \hat{3} \hat{5}$ (<i>la do mi sol</i>)	V ⁷ /ii = $\hat{6} \hat{\sharp 1} \hat{3} \hat{5}$ (<i>la di mi sol</i>)
ii ⁷ = $\hat{2} \hat{4} \hat{6} \hat{1}$ (<i>re fa la do</i>)	V ⁷ /V = $\hat{2} \hat{\sharp 4} \hat{6} \hat{1}$ (<i>re fi la do</i>)

Example 21: iii⁷, vi⁷ and ii⁷ Chords Altered To Become Secondary Dominants⁴

I^{M7} IV^{M7} vii^{ø7} iii⁷ V⁷/vi vi⁷ V⁷/ii ii⁷ V⁷/V V⁷ I

³ The superscript 7 following a Roman numeral designates a chordal minor 7th, as in V⁷ or ii⁷. The superscript M7 following a Roman numeral designates a chordal major 7th, as in I^{M7} or IV^{M7}.

⁴ Examples 21, 23 and 24 are intended to demonstrate the derivation of secondary dominants from their underlying diatonic chords. It would be unusual to find musical examples containing a series of diatonic 7ths followed by their chromaticized versions, as shown in these examples. More typical would be single tonicizations, such as V⁷/ii–ii, or a series of single tonicizations, such as V⁷/vi–vi–V⁷/ii–ii–V⁷/V–V, or a series of secondary dominants, like V⁷/iii–V⁷/vi–V⁷/ii–V⁷/V–V. For several such examples, see Examples 22, 25 and 27.

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Example 22 provides an example of the $V^7/ii-V/V-V^7-I$ progression in a Mozart excerpt:

Example 22: Mozart Sonata no. 6 in D major, K. 284, mvt. 3, Theme and Variations

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D: V V^7/ii V/V V^7 I IV V^6_3 I V^6 vii^o6/V $V^6_4=5$

The vii^o7 needs two alterations to become a secondary dominant: both the 3rd and 5th have to be raised by a chromatic half step to make the triad major:

$$vii^o7 = \hat{7} \hat{2} \hat{4} \hat{6} \text{ (ti re fa la)} \quad V^7/iii = \hat{7} \hat{\sharp 2} \hat{\sharp 4} \hat{6} \text{ (ti ri fi la)}$$

Example 23 shows the diatonic vii^o7 , iii^7 , vi^7 and ii^7 chords all transformed into secondary dominants:

Example 23: vii^o7 , iii^7 , vi^7 and ii^7 Chords Altered To Become Secondary Dominants

I^{M7} IV^{M7} vii^o7 V^7/iii iii^7 V^7/vi vi^7 V^7/ii ii^7 V^7/V V^7 I

Backing up one more chord brings us to the IV^{M7} . As with the diatonic IV triad, IV^{M7} cannot become a secondary dominant because the following chord, vii^o7 , is a half-diminished chord and cannot be tonicized. Additionally, the root movement from IV to vii^o7 is $\uparrow A4th/\downarrow d5th$.

Lastly, we have the I^{M7} , as shown in Example 24. Lowering the M7 by a chromatic half step to a m7 transforms it into V^7/IV . Note that the diatonic I^{M7} and the altered V^7/IV are *not* the same chord—a common error. I^{M7} has a diatonic major 7th (*ti*), and V^7/IV has a chromatic minor 7th (*te*):

$$I^7 = \hat{1} \hat{3} \hat{5} \uparrow \hat{7} \text{ (do mi sol ti)} \quad V^7/IV = \hat{1} \hat{3} \hat{5} \downarrow \hat{7} \text{ (do mi sol te)}$$

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Example 24: all Eligible Diatonic 7th Chords Altered To Become Secondary Dominants

Example 24 shows a circle of 5ths progression in C major. The chords are: I^{M7}, V⁷/IV, IV^{M7}, vii^{ø7}, V⁷/iii, iii⁷, V⁷/vi, vi⁷, V⁷/ii, ii⁷, V⁷/V, V⁷, and I. The notation is in treble and bass staves, with the bass line showing the root movement by descending fifths.

Finally, we can have a major-key chromatic 7th-chord circle of 5ths, where all the eligible diatonic 7th chords are replaced by their secondary dominant counterparts, as shown in Example 25:

Example 25: C Major Chromatic 7th-Chord Circle of 5ths⁵

Example 25 shows a chromatic 7th-chord circle of 5ths in C major. The chords are: V⁷/IV, IV^{M7}, V⁷/iii, V⁷/vi, V⁷/ii, V⁷/V, V⁷, and I. The notation is in treble and bass staves, with the bass line showing the root movement by descending fifths.

Examples 26 and 27 both contain a complete circle of 5ths progression, partly diatonic and partly chromatic, with a mix of secondary dominant triads and 7ths. Example 26 begins on the V⁶/ii (an altered vi chord) and ends on the ii⁶ chord. Example 27 begins on the V/IV (an altered I chord) in m. 10 and ends on tonic in m. 14.

Example 26: Mozart, Piano Sonata in B $\flat$ Major, K. 333, mvt. 1

Example 26 shows a circle of 5ths progression from Mozart's Piano Sonata in B $\flat$ Major, K. 333, mvt. 1. The chords are: B $\flat$: V⁶/ii, ii, ii⁴, V⁶, I, I^{M4}, IV^{M6}, vii^o, vii⁴, V⁶/vi, vi, vi⁴, and ii⁶. The notation is in treble and bass staves, with the bass line showing the root movement by descending fifths.

⁵ In a chromatic circle of 5ths with successive dominant 7th chords, each chordal 7th resolves down by step as expected. However, the 3rd of the chord (the leading tone of the object chord) must also resolve downward, by a chromatic half step, to become the chordal 7th of the following chord.

Example 27: Tchaikovsky, “Morning Prayer,” from Children’s Album, Op. 39, No. 1

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G: IV I $V\frac{2}{4}$ IV^6 I^4 IV V/iii V^6/vi V^6/ii $V\frac{2}{4}/V$ V^6 I IV^6 IV V I

2. Minor keys

In minor keys, as in major keys, adding 7ths to potential secondary dominant triads makes their function as secondary dominants far more robust. Example 28 reviews the diatonic 7th chords in the C minor circle of 5ths (and recall that the leading tone must always be added to create the V or V^7 chord), and Example 29 shows this progression in a song made famous by Frank Sinatra, “Fly Me to the Moon”:

Example 28: Diatonic 7th Chords in the C Minor Circle of 5ths

i^7 iv^7 VII^7 III^{M7} VI^{M7} $ii^{\circ 7}$ V^7 I

Example 29: “Fly Me to the Moon”

Words and Music by Bart Howard

c: i^7 iv^7 VII^7 III^{M7} VI^{M7} $ii^{\circ 7}$ V^7 i

Fly me to the moon, and let me play a-mong the stars;

Let me see what spring is like on Ju - pi - ter and Mars

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Note that four diatonic 7th chords (besides V^7 itself) have minor 7ths (i^7 , iv^7 , VII^7 , and $ii^{\circ 7}$), and two have major 7ths (III^{M7} , VI^{M7}). Recall also that secondary dominant 7th chords must be $Mm7$ chords.

To transform $ii^{\circ 7}$ into V^7/V , two alterations are needed: both the 3rd and 5th have to be raised by a chromatic half step, from $\hat{4}/fa$ to $\sharp\hat{4}/fi$, and $\downarrow\hat{6}/le$ to $\uparrow\hat{6}/la$, to make the triad major (shown in Example 30):

$$ii^{\circ 7} = \hat{2} \hat{4} \downarrow\hat{6} \hat{1} \text{ (re fa le do)} \quad V^7/V = \hat{2} \sharp\hat{4} \uparrow\hat{6} \hat{1} \text{ (re **fi** la do)}$$

Example 30: $ii^{\circ 7}$ altered to become a V^7/V

i^7 iv^7 VII^7 III^{M7} VI^{M7} $ii^{\circ 7}$ V^7/V V^7 i

The chord preceding $ii^{\circ 7}$ is VI^{M7} but the $ii^{\circ 7}$ cannot itself be tonicized both because the triad is diminished and the root motion from the preceding VI^{M7} chord is $\uparrow A4th/\downarrow d5th$.

Backing up one more chord brings us to the III^{M7} chord. Since the triad is already major, just one alteration is needed: lower the diatonic $M7$, $\hat{2}/re$, by a chromatic half step to $\flat\hat{2}/ra$ to create a $m7$ (shown in Example 31):

$$III^{M7} = \hat{3} \hat{5} \hat{7} \hat{2} \text{ (me sol te re)} \quad V^7/VI = \hat{3} \hat{5} \hat{7} \flat\hat{2} \text{ (me sol te **ra**)}$$

Example 31: III^{M7} altered to become a V^7/VI

i^7 iv^7 VII^7 III^{M7} V^7/VI VI^{M7} $ii^{\circ 7}$ V^7/V V^7 i

Preceding the III^{M7} is the VII^7 , which is already a $Mm7$; therefore, no alteration is needed for it to function as the V^7/III . You can see this in Example 32:

$$VII^7 = \downarrow\hat{7} \hat{2} \hat{4} \downarrow\hat{6} \text{ (te re fa le)} \quad V^7/III = \downarrow\hat{7} \sharp\hat{2} \hat{4} \downarrow\hat{6} \text{ (te re fa le)}$$

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Example 32: $VII^7 = V^7/III$

$i^7 \quad iv^7 \quad VII^7 \quad III^{M7} \quad V^7/VI \quad VI^{M7} \quad ii\emptyset^7 \quad V^7/V \quad V^7 \quad i$
 $=V^7/III$

The mm7 chords, i^7 and iv^7 , need just one alteration each to become secondary dominants: raise the thirds by a chromatic half step to make the triads major:

$$iv^7 = \hat{4} \downarrow \hat{6} \hat{1} \downarrow \hat{3} \text{ (fa le do me)} \quad V^7/VII = \hat{4} \uparrow \hat{6} \hat{1} \downarrow \hat{3} \text{ (fa **la** do me)}$$

$$i^7 = \hat{1} \downarrow \hat{3} \hat{5} \downarrow \hat{7} \text{ (do me sol te)} \quad V^7/iv = \hat{1} \uparrow \hat{3} \hat{5} \downarrow \hat{7} \text{ (do **mi** sol te)}$$

At this point, all eligible diatonic chords have now been altered to create secondary dominants, as can be seen in Example 33:

Example 33: iv^7 and i^7 altered to become Secondary Dominants. All Eligible Diatonic 7th Chords Transformed Into Secondary Dominants

$i^7 \quad V^7/iv \quad iv^7 \quad V^7/VII \quad VII^7 \quad III^{M7} \quad V^7/VI \quad VI^{M7} \quad ii\emptyset^7 \quad V^7/V \quad V^7 \quad i$
 $=V^7/III$

Example 34 shows the minor-key chromatic circle of 5ths, where all the eligible chords are replaced by their secondary dominant counterparts:

Example 34: C Minor Chromatic 7th-Chord Circle of 5ths

$V^7/iv \quad V^7/VII \quad V^7/III \quad V^7/VI \quad VI^{M7} \quad V^7/V \quad V^7 \quad i$

The Beethoven excerpt in Example 35 provides a typical example of the complete minor-key circle of 5ths, with a combination of triads and 7ths, some of which are diatonic and some of which are secondary

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dominants. The Mozart excerpt in Example 36 provides an example of a portion of the chromatic minor-key circle of 5ths, from $V^7/iv-VI$, where all chords but the final one (VI) are secondary dominants:

Example 35: Beethoven, Piano Sonata No. 1 in F minor, Op. 2 No 1, mvt 1, mm. 141–152

f: i_4^b V_2^b V_2^b/iv iv iv VII_2^b III VI^{M_6} ii° V_2^b i VI $ii_6^{\sharp}$ V^7 i
 $=V_2^b/III$

Example 36: Mozart String Quartet in D Minor, K. 421, mvt. 3⁶

d: V V^7/iv V^7/VII V^7/III V^7/VI VI Gr^{+6} V

Note that even though $VI^{(M_7)}$ cannot become a secondary dominant and tonicize ii° (because ii° is diminished and because the root movement is $\uparrow A4th/\downarrow d5th$), $VI^{(M_7)}$ it is nevertheless often found in this chromatic circle of 5ths progression as a $Mm7$. In such a case, that chord may be analyzed as the V^7 of the Neapolitan chord (V^7/N). The Neapolitan chord, like the augmented 6th chords, is a chromatic subdominant function chord that substitutes for the ii° and iv chords. For now, you should be aware that you can encounter the VI chord as a $Mm7$ in the circle of 5ths, as shown below in Example 37, and in the Chopin excerpt in Example 38:

⁶ The German augmented 6th chord (Gr^{+6}) in m. 28 is a colorful chromatic subdominant-function chord that substitutes for the ii° and iv chords—you will learn more about augmented 6th chords as you study chromatic chords.

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Example 37: VI altered to become V⁷/N

V⁷/iv V⁷/VII V⁷/III V⁷/VI V⁷/N V⁷/V V⁷ i

Example 38: Chopin Mazurka in G minor, Op. 67, no. 2

Bb: V⁷ V⁷ I V⁷/ii V⁷/V V⁷ V⁷/IV

V⁷/bVII V⁷/bIII V⁷/bVI V⁷/N V⁷/V V⁷ I

This Chopin Mazurka example has another interesting feature: the chromatic circle of 5ths begins in B^b major and continues through the parallel key of b^b minor before concluding back in B^b major! The progression begins in major with the V⁷/ii and continues through the V⁷/IV, at which point it switches to the parallel minor with the V⁷/bVII. It then continues through the V⁷/N before returning to B^b major at the end of the excerpt. In this progression, the root movement of $\uparrow A4th/\downarrow d5th$ is between the V⁷/N and the V⁷/V.

The combination of secondary dominants and the circle of 5ths make for highly utilitarian harmonic progressions. They can act as the bus to almost anywhere: a composer can jump off at any point and end up seamlessly in any number of keys, whether closely or distantly related. Looking again at the Chopin Mazurka, we can see that all of the following chords were tonicized, any of which could have become the tonics in a new key:

V ⁷ /ii: c minor	V ⁷ /V: F major	V ⁷ /IV: E ^b major
V ⁷ /bVII: A ^b major	V ⁷ /bIII: D ^b major	V ⁷ /bVI: G ^b major
V ⁷ /N: C ^b major		

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Lastly, we should note that secondary dominants are not relegated exclusively to circle of 5ths progressions. The excerpt in Example 39 is one of many which include secondary dominants that are not part of a circle of 5ths progression:

Example 39: Mozart, Piano Concerto No. 21 in C major, K. 467, mvt. 1

52

C: I V⁷/ii ii V⁷/IV IV V⁷/V V V⁷/vi VI^(ADD6)/vi

A number of exercises follow, asking you to notate secondary dominants. Your instructor will determine which ones you should complete.

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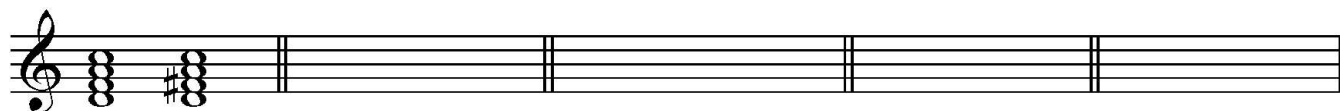
I. Spelling Secondary Dominants

In each measure below, provide the key signature and notate the requested ii^7 or $ii^{\emptyset 7}$ chord, then alter it as necessary to create the V^7/V chord. Be sure to think about the scale degrees and syllables in each key as you build the chords, and remember to include any necessary accidentals. The first one has been done for you.

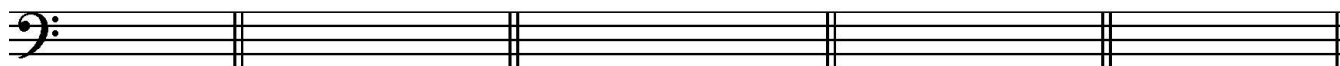
1. **Major Keys:** Don't forget to sharp the 4th scale degree (from *fa* to *fi*) for V^7/V .

$ii^7 = \hat{2} \hat{4} \hat{6} \hat{1}$ (*re fa la do*)

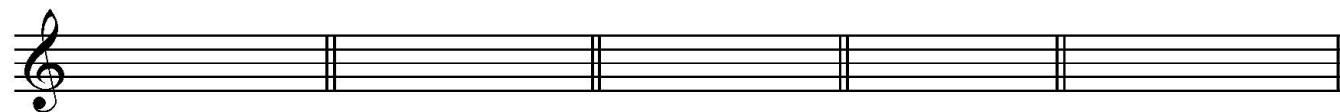
$V^7/V = \hat{2} \sharp \hat{4} \hat{6} \hat{1}$ (*re **fi** la do*)



C: ii^7 V^7/V D: ii^7 V^7/V E: ii^7 V^7/V F: ii^7 V^7/V G: ii^7 V^7/V



A: ii^7 V^7/V B: ii^7 V^7/V C#: ii^7 V^7/V D#: ii^7 V^7/V E#: ii^7 V^7/V

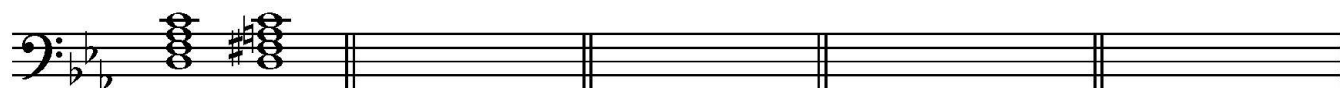


F#: ii^7 V^7/V G#: ii^7 V^7/V A#: ii^7 V^7/V B#: ii^7 V^7/V C#: ii^7 V^7/V

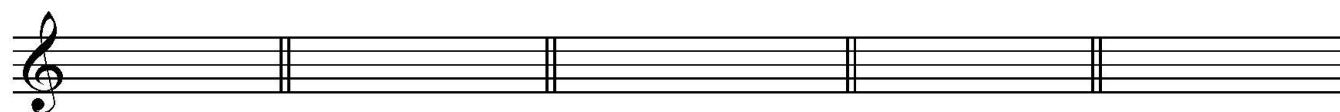
2. **Minor Keys:** make sure you use the natural (minor) 6th scale degree ($\downarrow \hat{6}/le$) when building the supertonic 7th chord, but use the raised 6th scale degree ($\uparrow \hat{6}/la$), as well as the raised 4th scale degree (*fi*) for the V^7/V . The first one has been done for you.

$ii^{\emptyset 7} = \hat{2} \hat{4} \downarrow \hat{6} \hat{1}$ (*re fa le do*)

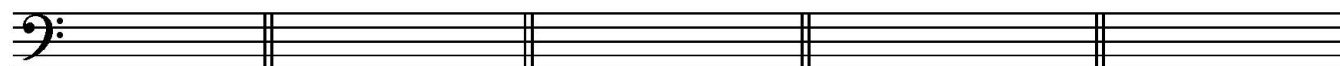
$V^7/V = \hat{2} \sharp \hat{4} \uparrow \hat{6} \hat{1}$ (*re **fi** la do*)



c: $ii^{\emptyset 7}$ V^7/V d: $ii^{\emptyset 7}$ V^7/V e: $ii^{\emptyset 7}$ V^7/V f: $ii^{\emptyset 7}$ V^7/V g: $ii^{\emptyset 7}$ V^7/V



a: $ii^{\emptyset 7}$ V^7/V b: $ii^{\emptyset 7}$ V^7/V c#: $ii^{\emptyset 7}$ V^7/V d#: $ii^{\emptyset 7}$ V^7/V e#: $ii^{\emptyset 7}$ V^7/V



f#: $ii^{\emptyset 7}$ V^7/V g#: $ii^{\emptyset 7}$ V^7/V a#: $ii^{\emptyset 7}$ V^7/V b#: $ii^{\emptyset 7}$ V^7/V

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Answer Key**1. Major Keys**

C: ii⁷ V⁷/V D: ii⁷ V⁷/V E: ii⁷ V⁷/V F: ii⁷ V⁷/V G: ii⁷ V⁷/V

A: ii⁷ V⁷/V B: ii⁷ V⁷/V C#: ii⁷ V⁷/V Db: ii⁷ V⁷/V Eb: ii⁷ V⁷/V

F#: ii⁷ V⁷/V Gb: ii⁷ V⁷/V Ab: ii⁷ V⁷/V Bb: ii⁷ V⁷/V Cb: ii⁷ V⁷/V

2. Minor Keys:

c: ii^{ø7} V⁷/V d: ii^{ø7} V⁷/V e: ii^{ø7} V⁷/V f: ii^{ø7} V⁷/V g: ii^{ø7} V⁷/V

a: ii^{ø7} V⁷/V b: ii^{ø7} V⁷/V c#: ii^{ø7} V⁷/V d#: ii^{ø7} V⁷/V eb: ii^{ø7} V⁷/V

f#: ii^{ø7} V⁷/V g#: ii^{ø7} V⁷/V ab: ii^{ø7} V⁷/V a#: ii^{ø7} V⁷/V bb: ii^{ø7} V⁷/V

II. Creating secondary dominant TRIADS in the circle of 5ths: Major Keys

In each exercise below, notate the requested secondary dominant triad under the X. Alter the half-note chord at the beginning of the measure to create the requested secondary dominant. Remember that each of the half-note chords must be altered to become a major triad. The first one has been done for you.

Example

C: I (=V/IV) IV vii° V/iii iii V/vi vi V/ii ii V/V V I

Solution

C: I (=V/IV) IV vii° V/iii iii V/vi vi V/ii ii V/V V I

=====

1.

G: I (=V/IV) IV vii° V/iii iii V/vi vi V/ii ii V/V V I

2.

D: I (=V/IV) IV vii° V/iii iii V/vi vi V/ii ii V/V V I

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3. X X X X

A: I (=V/IV) IV vii° V/iii iii V/vi vi V/ii ii V/V V I

4. X X X X

F: I (=V/IV) IV vii° V/iii iii V/vi vi V/ii ii V/V V I

5. X X X X

B $\flat$: I (=V/IV) IV vii° V/iii iii V/vi vi V/ii ii V/V V I

6. X X X X

E $\flat$: I (=V/IV) IV vii° V/iii iii V/vi vi V/ii ii V/V V I

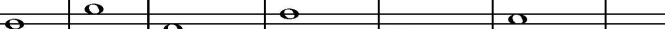
Answer Key: Creating secondary dominant TRIADS in the circle of 5ths: Major Keys

G: I (=V/IV) IV vii^o V/iii iii V/vi vi V/ii ii V/V V I

D: I (=V/IV) IV vii^o V/iii iii V/vi vi V/ii ii V/V V I

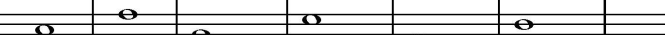
3. 

A: I (=V/IV) IV vii^o V/iii iii V/vi vi V/ii ii V/V V I

4. 

F: I (=V/IV) IV vii^o V/iii iii V/vi vi V/ii ii V/V V I

Bb: I (=V/IV) IV vii^o V/iii iii V/vi vi V/ii ii V/V V I

6. 

E♭: I (=V/IV) IV vii^o V/iii iii V/vi vi V/ii ii V/V V I

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III. Creating secondary dominant TRIADS in the circle of 5ths: Minor Keys

In each exercise below, notate the requested secondary dominant triad under the X. Alter the half-note chord at the beginning of the measure to create the requested secondary dominant. Remember that each of the half-note chords has to be altered to become a major triad. The first one has been done for you.

Example

c: i V/iv iv V/VII VII III VI ii° V/V V i

Solution

c: i V/iv iv V/VII VII III VI ii° V/V V I

1.

g: i V/iv iv V/VII VII III VI ii° V/V V i

2.

d: i V/iv iv V/VII VII III VI ii° V/V V i

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3. X X X

a: i V/iv iv V/VII VII III VI ii° V/V V i

4. X X X

e: i V/iv iv V/VII VII III VI ii° V/V V i

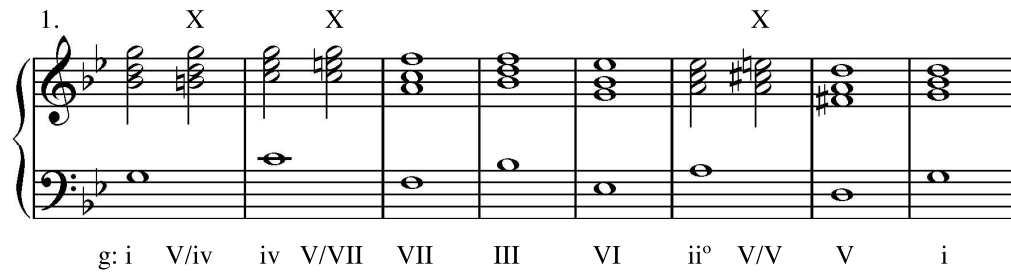
5. X X X

b: i V/iv iv V/VII VII III VI ii° V/V V i

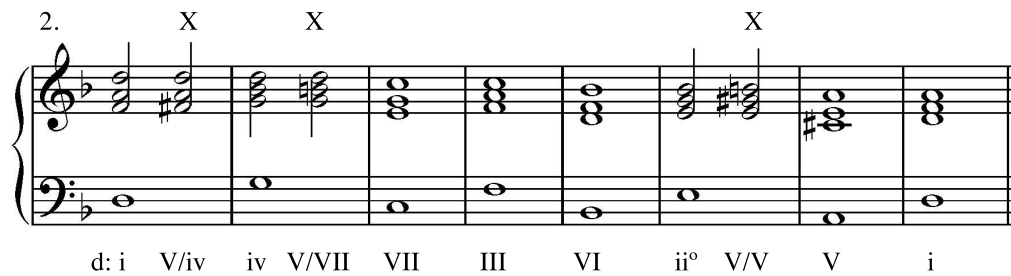
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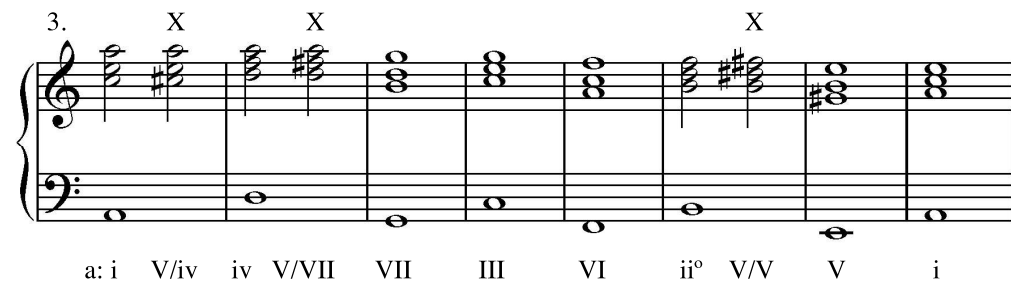
Answer Key: Creating secondary dominant Triads in the circle of 5ths: Minor Keys

1. 

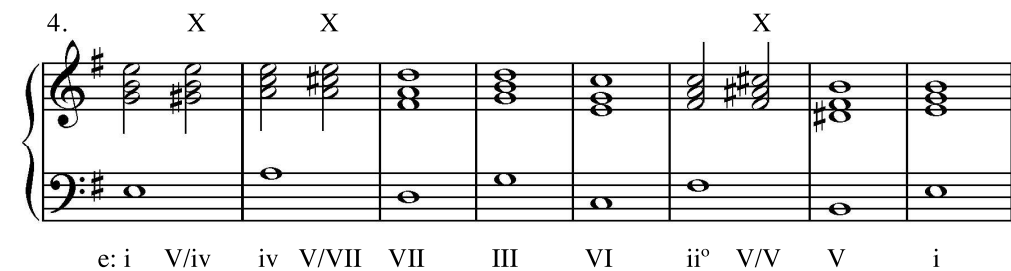
g: i V/iv iv V/VII VII III VI ii° V/V V i

2. 

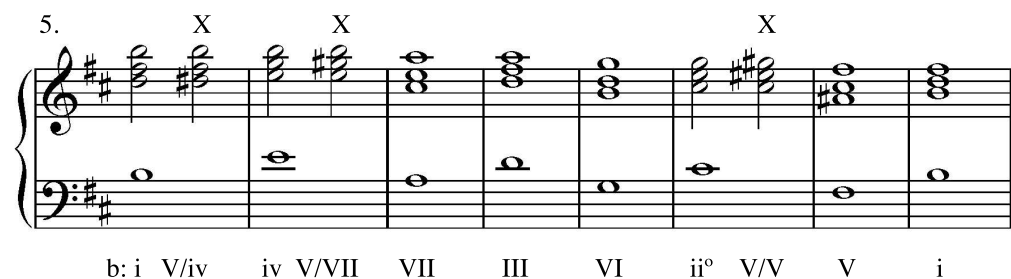
d: i V/iv iv V/VII VII III VI ii° V/V V i

3. 

a: i V/iv iv V/VII VII III VI ii° V/V V i

4. 

e: i V/iv iv V/VII VII III VI ii° V/V V i

5. 

b: i V/iv iv V/VII VII III VI ii° V/V V i

IV. Creating secondary dominant SEVENTHS in the circle of 5ths: Major Keys

In each exercise below, notate the requested secondary dominant seventh chord under the X. Alter the half-note chord at the beginning of the measure to create the requested secondary dominant. Remember that each of the half-note chords has to be altered to become a Mm7. The first one has been done for you.

Example

C: I (=V/IV) IV viiø7 V7/iii iii7 V7/vi vi7 V7/ii ii7 V7/V V V7 I

Solution

C: I (=V/IV) IV viiø7 V7/iii iii7 V7/vi vi7 V7/ii ii7 V7/V V V7 I

=====

1.

G: I (=V/IV) IV viiø7 V7/iii iii7 V7/vi vi7 V7/ii ii7 V7/V V V7 I

2.

D: I (=V/IV) IV viiø7 V7/iii iii7 V7/vi vi7 V7/ii ii7 V7/V V V7 I

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3.

A: I (=V/IV) IV vii°7 V7/iii iii7 V7/vi vi7 V7/ii ii7 V7/V V V7 I

4.

F: I (=V/IV) IV vii°7 V7/iii iii7 V7/vi vi7 V7/ii ii7 V7/V V V7 I

5.

Bb: I (=V/IV) IV vii°7 V7/iii iii7 V7/vi vi7 V7/ii ii7 V7/V V V7 I

6.

Eb: I (=V/IV) IV vii°7 V7/iii iii7 V7/vi vi7 V7/ii ii7 V7/V V V7 I

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Answer Key: Creating secondary dominant SEVENTHS in the circle of 5ths: Major Keys

1. X X X X X

G: I (=V/IV) IV vii^{ø7} V⁷/iii iii⁷ V⁷/vi vi⁷ V⁷/ii ii⁷ V⁷/V V V⁷ I

2. X X X X X

D: I (=V/IV) IV vii^{ø7} V⁷/iii iii⁷ V⁷/vi vi⁷ V⁷/ii ii⁷ V⁷/V V V⁷ I

3. X X X X X

A: I (=V/IV) IV vii^{ø7} V⁷/iii iii⁷ V⁷/vi vi⁷ V⁷/ii ii⁷ V⁷/V V V⁷ I

4. X X X X X

F: I (=V/IV) IV vii^{ø7} V⁷/iii iii⁷ V⁷/vi vi⁷ V⁷/ii ii⁷ V⁷/V V V⁷ I

5. X X X X X

Bb: I (=V/IV) IV vii^{ø7} V⁷/iii iii⁷ V⁷/vi vi⁷ V⁷/ii ii⁷ V⁷/V V V⁷ I

6. X X X X X

Eb: I (=V/IV) IV vii^{ø7} V⁷/iii iii⁷ V⁷/vi vi⁷ V⁷/ii ii⁷ V⁷/V V V⁷ I

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V. Creating secondary dominant SEVENTHS in the circle of 5ths: Minor Keys

In each exercise below, notate the requested secondary dominant seventh chord under the X. Alter the half-note chord at the beginning of the measure to create the requested secondary dominant. Remember that each of the half-note chords has to be altered to become a Mm7. The first one has been done for you.

Example

c: i V⁷/iv iv⁷ V⁷/VII VII V⁷/III III^{M7} V⁷/VI VI^{M7} iiø⁷ V⁷/V V V⁷ i

Solution

c: i V⁷/iv iv⁷ V⁷/VII VII V⁷/III III^{M7} V⁷/VI VI^{M7} iiø⁷ V⁷/V V V⁷ i

=====

1.

g: i V⁷/iv iv⁷ V⁷/VII VII V⁷/III III^{M7} V⁷/VI VI^{M7} iiø⁷ V⁷/V V V⁷ i

2.

d: i V⁷/iv iv⁷ V⁷/VII VII V⁷/III III^{M7} V⁷/VI VI^{M7} iiø⁷ V⁷/V V V⁷ i

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3. X X X X X X

a: i V⁷/iv iv⁷ V⁷/VII VII V⁷/III III^{M7} V⁷/VI VI^{M7} ii^{ø7} V⁷/V V V⁷ i

4. X X X X X X

e: i V⁷/iv iv⁷ V⁷/VII VII V⁷/III III^{M7} V⁷/VI VI^{M7} ii^{ø7} V⁷/V V V⁷ i

5. X X X X X X

b: i V⁷/iv iv⁷ V⁷/VII VII V⁷/III III^{M7} V⁷/VI VI^{M7} ii^{ø7} V⁷/V V V⁷ i