Playing on the LI All the Rules necessary to attain to a Perfection on that Instrument, with great variety of Compositions, which will also be very useful to those who study the Violoncello, Karpsichord &c.

Composed by

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Opera.IX.

LONDON. MDCCLI.

P R E F A C E.

H E Intention of Mufick is not only to pleafe the Ear, but to express Sentiments, frike the Imagination, affect the Mind, and command the Passions. The Art of playing the Violin confists in giving that Inftrument a Tone that shall in a Manner rival the most perfect human Voice; and in executing every Piece with Exactness, Propriety, and Delicacy of Expression according to the true Intention of Musick. But as the imitating the Cock, Cuckoo, Owl, and other Birds; or the Drum, French Horn, Tromba-Marina, and the like; and also fudden Shifts of the Hand from one Extremity of the Finger-board to the other, accompanied with Contortions of the Head and Body, and all other fuch Tricks rather belong to the Professor of Legerdemain and Posture-masters than to the Art of Musick, the Lovers of that Art are not to expect to find any thing of that Sort in this Book. But I flatter myself they will find in it whatever is Necessary for the Institution of a just and regular Performer on the Violin. This Book will also be of Use to Performers on the Violoncello, and in forme Sort to those who begin to study the Art of Composition.

After the feveral Examples, I have added twelve Pieces in different Stiles for a Violin and Violoncello with a thorough Bass for the Harpfichord. I have not given any Directions for the performing them; because I think the Learner will not need any, the foregoing Rules and Examples being sufficient to qualify him to perform any Musick whatsoever.

I have nothing farther to add, but to beg the Favour of all Lovers of Musick to receive this Book with the fame Candour that it is offered to them, by their

Most obedient humble Servant,

F. G.

Example I.

## ( A. )

A Reprefents the Finger-board of a Violin, on which are marked all the Tones and Semitones, within the Compass of that Inftrument, according to the *Diatonick* Scale; they are 23 in Number, viz. three Octaves and a Tone; and in every Octave of the *Diatonick* Scale there are five Tones and two of the greater Semitones. I would recommend it to the Learner, to have the Finger-board of his Violin marked in the fame Manner, which will greatly facilitate his learning to ftop in Tune.

## ( B. )

B fhews a Method of acquiring the true Polition of the Hand, which is this: To place the first Finger on the first String upon F; the fecond Finger on the fecond String upon C; the third Finger on the third String upon G; and the fourth Finger on the fourth String upon D. This must be done without raising any of the Fingers, till all four have been fet down; but after that, they are to be raifed but a little Distance from the String they touched; and by fo doing the Position is perfect.

The Violin must be refted just below the Collar-bone, turning the right-hand Side of the Violin a little downwards, so that there may be no Necessity of raising the Bow very high, when the fourth String is to be struck.

Observe also, that the Head of the Violin must be nearly Horizontal with that Part which rest against the Breast, that the Hand may be shifted with Facility and without any Danger of dropping the Instrument.

The Tone of the Violin principally Depends upon the right Management of the Bow. The Bow is to be held at a fmall Diftance from the Nut, between the Thumb and Fingers, the Hair being turned inward against the Back or Outside of the Thumb, in which Position it is to be held free and easy, and not stiff. The Motion is to proceed from the Joints of the Wrist and Elbow in playing quick Notes, and very little or not at all from the Joint of the Shoulder ; but in playing long Notes, where the Bow is drawn from one End of it to the other, the Joint of the Shoulder is also a little employed. The Bow must always be drawn parallel with the Bridge, (which can't be done if it is held stiff) and must be pressed upon the Strings with the Fore-finger only, and not with the whole Weight of the Hand. The best Performers are least sparing of their Bow ; and make Use of the whole of it, from the Point to that Part of it under, and even beyond their Fingers. In an Upbow the Hand is bent a little downward from the Joint of the Wrist, when the Nut of the Bow approaches the Strings, and the Wrist is immediately strings for the Hand rather a little bent back or upward, as foon as the Bow is began to be drawn down again.

One of the principal Beauties of the Violin is the fwelling or encreasing and fostening the Sound; which is done by preffing the Bow upon the Strings with the Fore-finger more or lefs. In playing all long Notes the Sound should be begun fost, and gradually swelled till the Middle, and from thence gradually softened till the End. And lastly, particular Care must be taken to draw the Bow smooth from one End to the other without any Interruption or stopping in the Middle. For on this principally, and the keeping it always parallel with the Bridge, and prefsing it only with the Fore-finger upon the Strings with Difcretion, depends the fine Tone of the Instrument.

( C. )

C fhews the 7 Orders. What I mean by an Order is a certain Number of Notes which are to be played without transposing the Hand. The first Order contains 17 Notes, and the other fix Orders contain no more than fixteen.

Under the Notes of the first Order you will find their Names, and over the fame Notes Figures denoting the Fingers with which they are to be stopped, and the Strings on which they are stopped.

It must be observed that between the two black Notes is the greater Semitone, and between the others is the Tone,

The Mark (o) denotes an open String.

From the first Order you are to begin to play.

'Tis neceffary to place the Fingers exactly upon the Marks that belong to the Notes; for on this depends the flopping perfectly in Tune,

After having been practifed in the first Order, you must pass on to the fecond, and then to the third; in which Care is to be taken that the Thumb always remain farther back than the Fore-finger; and the more you advance in the other Orders the Thumb must be at a greater Distance till it remains almost hid under the Neck of the Violin.

It is a conftant Rule to keep the Fingers as firm as possible, and not to raife them, till there is a Necessity of doing it, to place them fomewhere else; and the Observance of this Rule will very much facilitate the playing double Stops.

The fingering, indeed, requires an earnest Application, and therefore it would be most prudent to undertake it without the Use of the Bow, which you should not meddle with till you come to the 7th Example, in which will be found the necessary and proper Method of using it. It cannot be supposed but that this Practice without the Bow is disagreable, fince it gives no Satisfaction to the Ear; but the Benefit which, in Time, will arise from it, will be a Recompence more than adequate to the Disgust it may give.

## ( D. )

D fhews the different Ways of flopping the fame Note, and difcovers at the fame Time, that Transposition of the Hand confifts in passing from one Order to another.

#### As for Example.

If a Note ought to be flopped by the fourth Finger on any String whatfoever, in the first Order, and the fame Note be flopped by the third Finger, it will pass into the fecond Order; and if by the fecond Finger into the third; and confequently by flopping it with the first, it enters into the fourth Order.

On the contrary, if the first Finger stopping any Note what sever falls under the fourth Order; by stopping the fame Note with the second Finger it passes into the third; by stopping the fame with the third, into the second; and finally by stopping the same with the fourth Finger it enters into the first.

This is fufficient to shew what Transposition of the Hand is. I have only now to recommend a good Execution of the whole, both in rising and falling; and great Care in conducting the Hand, as also in the placing the Fingers exactly on the Marks. With all these the Practitioner must by Degrees acquire Quickness.

## ( E. )

E contains feveral different Scales, with the Transpositions of the Hand, which ought to be made both in rising and falling. It must here be observed, that in drawing back the Hand from the 5th, 4th and 3d Order to go to the first, the Thumb cannot, for Want of Time, be replaced in its natural Position; but it is necessary it should be replaced at the fecond Note.

A Sharp (#) raifes the Note to which it is prefixed, a Semitone higher; as for Example, when a Sharp is prefixed to C, the Finger muft be placed in the Middle between C and D, and fo of the reft, except B and E; for when a Sharp is prefixed to either of them, the Finger muft be placed upon C and F. A Flat ( $\flat$ ) on the Contrary renders the Note to which it is prefixed, a Semitone lower: As for Example, when a Flat is prefixed to B the Finger muft be placed in the Middle between B and A, and fo of the Reft except F and C; for when a Flat is prefixed to either of them the Finger muft be placed upon E and B natural. This Rule concerning the Flats and Sharps is not abfolutely exact; but it is the eafieft and beft Rule that can be given to a Learner. This Mark ( $\frac{1}{4}$ ) takes away the Force of both the Sharp and the Flat and reftores the Note before which it is placed to its natural Quality.

## Example II.

In This Example there are 13 Scales, composed of the *Diatonick* and *Cromatick* Genera. Many may, perhaps, imagine that these Scales are meerly *Cromatic*, as they may not know that the *Cromatic* Scale must be composed only of the greater and leffer Semitones; and that the Octave also must be devided into 12 Semitones, that is, 7 of the greater and 5 of the leffer; but the prefent 13 Scales being composed of Tones and the greater and leffer Semitones, and the Octave containing 2 Tones, 5 of the greater Semitones and 3 of the leffer, I call them mixt. Take notice that the Sign (ma) fignifies Major or greater, and the Sign (mi) Minor or leffer.

The Polition of the Fingers marked in the first Scale (which is that commonly practifed) is a faulty one; for two Notes cannot be stopped successively by the fame Finger without Difficulty, especially in quick Time.

## Example III.

Contains 4 Scales of the *Diatonick Genus* transposed; and here, not to burthen the Memory of the Beginner, all the Flats (b) instead of being marked at the beginning of the Staff, are marked immediately before the Notes which they belong to; but their true Situation may be seen at the End of the Staff.

## Example IV.

In this Example are contained 9 Scales transposed, and composed of the *Diatonick* and *Cromatic Genera*; I have used the same Method of marking the Flats in the first eight Scales, and the Sharp in the ninth Scale, as in the former Example.

'Tis neceffary in this Example to be very exact in observing the Distance between one Note and another, as also the Position of the Fingers, and the Transposition of the Hand. The Position of the Fingers in the last Scale is extreamly faulty and is set down meerly by Way of Caution to the Learner to avoid it. The Scales in this Example begin at the Mark ( $\bigcirc$ ) and are to be practified backward as well as forward.

## Example V.

In this there are 4 Diatonick Scales transposed, and with different Transpositions of the Hand. Let it be observed that after you have practised them in ascending they should be practised also back again.

## Example VI.

This Example contains 6 Scales composed both of the *Diatonick* and *Cromatic* transposed. Observe when the Sign (x) comes before C, your Finger must be put upon D; and when the fame Sign is before F, the Finger must be upon G.

## Example VII.

This contains 14 Scales, composed of all the Intervals which belong to the Diatonick Genus. In which are variety of Transpositions of the Hand. I must here remaind you to let the Fingers reft as firm as possible on the String, in the Manner already mentioned. These Scales should be executed with the Bow, and it will be therefore necessary to practice for some Days, all that is contained in the 24th Example, in order not to consolut the Execution of the Fingers with that of the Bow.

### Example VIII.

In this are contained 20 Scales in different Keys, very useful for acquiring Time and the ftopping in Tune. Here it must be observed, that you are to execute them by drawing the Bow down and up, or up and down alternately; taking Care not to follow that wretched Rule of drawing the Bow down at the first Note of every Bar.

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## Example IX.

In this Example are contained 16 Variations, most useful in Regard to Time, to the Bowing, the stopping in Tune and the Execution. Again you must be careful to keep the Fingers as firm as possible on the Strings, and also in bowing employ the Wrist much, the Arm but little, and the Shoulder not at all.

## Example X.

This Example is composed of Scales mixt with various Passages and Modulations, which are often repeated with different Transpositions of the Hand; and is calculated to render the Labour of Practice more pleasant.

## Example XI.

This Example is transposed from the other, a Tone higher, to that the Melody may be faid to be the fame, but the Accompanyment is quite different.

#### Example XII.

In order to execute this Composition well, 'tis neceffary to examine very frequently the Transpositions of the Hand in it, until they are entirely impressed on the Mind; and then to practice the 24th Example for acquiring the free Use of the Bow, and after proceed to execute this Example, which will be then found not so difficult as it may at first be thought.

## Example XIII.

This Movement ought to be executed in fuch a Manner as to refemble an affecting Difcourfe, and cannot be justly performed without having first well comprehended and often practifed what is contained in the 18th Example.

## Example XIV.

In this are contained 14 Scales; fome of which are composed in Keys with a third *Major*, and the others in Keys with a third *Minor*. These Scales ought to executed with Quickness, and in order to execute them well, you must take Care to put in Practice the Rules laid down in the 12th Example.

## Example XV.

This contains the 7 Orders already mentioned, which proceed one after another without concluding or making any Cadence. Here also is introduced the *Cromatic* Flat, ( $\blacklozenge$ ) and the *Cromatic* Sharp. ( $\ddagger$ ) The Sign ( $\frown$ ) fignifies the laft Note of the Order, and the Sign (I) the first Note of the fucceeding Order, upon which the Hand is to be transposed.

I am fenfible that the Modulation of these Orders is fomewhat harsh, but however very useful; for a good Profession of the Violin is obliged to execute with Propriety and Justness, every Composition that is laid before him; but he who has never played any other Musick than the agreeable and common Modulation, when he comes to play at Sight what is directly opposite to it, must be very much at a Loss.

### Example XVI.

This Example fhews in how many different Manners of bowing you may play 2, 3, 4, 5 and 6 Notes. As for Inftance, 2 Notes may be played in 4 different Manners, 3 Notes in eight, 4 in 16, 5 in 32, and 6 in 62. It must be observed, that the Example marked with the Letter A is of 2 Notes, B, 3, C, 4, D, 5, and the Letter F, 6. The Letter (g) denotes that the Bow is to be drawn downwards; and the Letter (s) that it must be drawn upwards. The Learner should be indefatigable in practifing this Example till he has made himself a perfect Master of the Art of Bowing. For it is to be held as a certain Principle that he who does not possible, in a perfect Degree, the Art of Bowing, will never be able the render the Melody agreeable nor arrive at a Facility in the Execution.

#### Example XVII.

This Example only differs from the foregoing, as to what concerns Time and Composition; in other Respects it is the same.

## Example XVIII.

Contains all the Ornaments of Expression, necessary to the playing in a good Taste.

What is commonly call'd good Tafte in finging and playing, has been thought for fome Years past to destroy the true Melody, and the Intention of their Composers. It is supposed by many that a real good Taste cannot possibly be acquired by any Rules of Art; it being a peculiar Gift of Nature, indulged only to those who have naturally a good Ear : And as most flatter themselves to have this Perfection, hence it happens that he who fings or plays, thinks of nothing to much as to make continually fome favourite Paffages or Graces, believing that by this Means he shall be thought to be a good Performer, not perceiving that playing in good Tafte doth not confift of frequent Paffages, but in expressing with Strength and Delicacy the Intention of the Composer. This Expression is what every one should endeavour to acquire, and it may be easily obtained by any Person, who is not too fond of his own Opinion, and doth not obstinately refist the Force of true Evidence. I would not however have it supposed that I deny the powerful Effects of a good Ear; as I have found in feveral Instances how great its Force is : I only affert that certain Rules of Art are neceffary for a moderate Genius, and may improve and perfect a good one. To the End therefore that those who are Lovers of Musick may with more Ease and Certainty arrive at Perfection, I recommend the Study and Practice of the following Ornaments of Expression, which are fourteen in Number; namely,

If A plain Shake (h) 2<sup>d</sup> A Turn'd Shake (+) 3<sup>d</sup> A fuperior Apogiatura (h)4<sup>th</sup> An inferior Apogiatura (h) 5<sup>th</sup> Holding the Note (-) 6<sup>th</sup> Staccato (|) 7<sup>th</sup> Swelling the Sound (-) 8<sup>th</sup> Diminifhing the Sound (-) 9<sup>th</sup> Piano (p.) 10<sup>th</sup> Forte (f.)11<sup>th</sup> th. Anticipation (h) 12<sup>th</sup> Separation (h) 13<sup>th</sup> A Beat (//) 14<sup>th</sup> A close Shake (-) From the following Explanation we may comprehend the Nature of each Element in particular.

## (Firft) Of the Plain Shake.

The plain Shake is proper for quick Movements; and it may be made upon any Note, observing after it to pass immediately to the ensuing Note.

#### (Second) Of the TURNED SHAKE.

The turn'd Shake being made quick and long is fit to express Gaiety; but if you make it short, and continue the Length of the Note plain and soft, it may then express some of the more tender Passions.

## (Third) Of the Superior APOGIATURA.

The Superior Apogiatura is supposed to express Love, Affection, Pleasure, Sc. It should be made pretty long, giving it more than half the Length or Time of the Note it belongs to, observing to swell the Sound by Degrees, and towards the End to force the Bow a little: If it be made short, it will lose much of the aforesaid Qualities; but will always have a pleasing Effect, and it may be added to any Note you will.

## (Fourth) Of the Inferior APOGIATURA.

The Inferior Apogiatura has the fame Qualities with the preceding, except that it is much more confin'd, as it can only be made when the Melody rifes the Interval of a fecond or third, observing to make a Beat on the following Note.

## (Fifth) Of Holding a NOTE.

It is neceffary to use this often; for were we to make Beats and Shakes continually without fometimes fuffering the pure Note to be heard, the Melody would be too much diversified.

## (Sixth) Of the STACCATO.

This expresses Reft, taking Breath, or changing a Word; and for this Reason Singers should be careful to take Breath in a Place where it may not interrupt the Sense.

## (7th and 8th) Of Swelling and Softening the Sound.

These two Elements may be used after each other; they produce great Beauty and Variety in the Melody, and employ'd alternately, they are proper for any Expression or Measure.

## (*oth* and *ioth*) Of PIANO and FORTE.

They are both extremely neceffary to express the Intention of the Melody; and as all good Musick should be composed in Imitation of a Discourse, these two Ornaments are defigned to produce the same Effects that an Orator does by raising and falling his Voice.

## (*Eleventb*) Of ANTICIPATION.

Anticipation was invented, with a View to vary the Melody, without altering its Intention: When it is made with a Beat or a Shake, and fwelling the Sound, it will have a greater Effect, especially if you observe to make use of it when the Melody rises or descends the Interval of a Second.

## (Twelftb) Of the SEPARATION.

The Separation is only defigned to give a Variety to the Melody, and takes place most properly when the Note rifes a Second or Third; as also when it defcends a Second, and then it will not be amiss to add a Beat, and to swell the Note, and then make the *Apogiatura* to the following Note. By this Tenderness is express'd.

## (Thirteenth) Of the BEAT.

This is proper to express feveral Passions; as for Example, if it be perform'd with Strength, and continued long, it expresses Fury, Anger, Resolution, S.c. If it be play'd less strong

and

and shorter, it expresses Mirth, Satisfaction, S.c. But if you play it quite soft, and swell the Note, it may then denote Horror, Fear, Grief, Lamentation, S.c. By making it short and fwelling the Note gently, it may express Affection and Pleasure.

## (*Fourteentb*) Of the Clofe SHAKE.

This cannot possibly be described by Notes as in former Examples. To perform it, you must prefs the Finger strongly upon the String of the Instrument, and move the Wrist in and out slowly and equally, when it is long continued swelling the Sound by Degrees, drawing the Bow nearer to the Bridge, and ending it very strong it may express Majesty, Dignity, Sc. But making it shorter, lower and softer, it may denote Affliction, Fear, Sc. and when it is made on short Notes, it only contributes to make their Sound more agreable and for this Reason it should be made use of as often as possible.

Men of purblind Understandings, and half Ideas may perhaps ask, is it possible to give Meaning and Expression to Wood and Wire; or to bestow upon them the Power of raising and soothing the Passions of rational Beings? But whenever I hear such a Question put, whether for the Sake of Information, or to convey Ridicule, I shall make no Difficulty to answer in the Affirmative, and without fearching over-deeply into the Cause, shall think it sufficient to appeal to the Effect. Even in common Speech a Difference of Tone gives the same Word a different Meaning. And with Regard to musical Performances, Experience has shewn that the Imagination of the Hearer is in general so much at the Disposal of the Master, that by the Help of Variations, Movements, Intervals and Modulation he may almost stamp what Impression on the Mind he pleases.

These extraordinary Emotions are indeed most easily excited when accompany'd with Words; and I would besides advise, as well the Composer as the Performer, who is ambitious to infpire his Audience, to be first inspired himself; which he cannot fail to be if he chuses a Work of Genius, if he makes himself thoroughly acquainted with all its Beauties; and if while his Imagination is warm and glowing he pours the same exalted Spirit into his own Performance.

### Example XIX.

In this is shewn how a single Note (in show Time) may be executed with different Ornaments of Expressions.

## Example XX.

This Example shews the Manner of Bowing proper to the Minim, Crochet-quaver and Semiquaver both in flow and quick Time. For it is not sufficient alone to give them their true Duration, but also the Expression proper to each of these Notes. By not confidering this, it often happens that many good Compositions are spoiled by those who attempt to execute them.

You muft observe that this Sign  $(\checkmark)$  denotes the Swelling of the Sound; the Sign  $(\frown)$  fignifies that the Notes are to be play'd plain and the Bow is not to be taken off the Strings; and this (1) a Staccato, where the Bow is taken off the Strings at every Note.

## Example XXI.

In this are fhewn the different Way of playing Arpeggios on Chords composed of 3 or 4 Sounds. Here are composed 18 Variations on the Chords contained in N<sup>°</sup>. 1. by which the Learner will see in what the Art of executing the Arpeggio consists.

Example

## Example XXII.

In this Example are contained all the double Stops between the Unifon and the Octave, and these again are repeated many Times with different Positions of the Fingers; so that in any Order whatsoever where any one of them is found you may know how to play it. Those who, with Quickness and Exactness, shall execute this Example, will find themselves far advanced in the Art of playing double Stops.

## Example XXIII.

This contains two Compositions of Scales of double Stops, which are thrice repeated with different Transpositions of the Hand, in order to remove all Pain and Difficulty in the Practice. It must be observed, that after having shifted the Hand, you must pursue what follows in the same Order, till the following Number points out a new Transposition.

### Example XXIV.

From this Example the Art of Bowing will eafily be acquired, and also that of playing in Time. The Letter (g) denotes that the Bow is to be drawn downwards; the Letter (s) that it must be drawn upwards. The Sign (S) fignifies a Repetition.

You must (above all Things) observe to draw the Bow down and up alternately. The Bow must always be drawn strait on the Strings, and never be raifed from them in playing Semi-quavers. This Practice of the Bow should be continued, without attempting any Thing else until the Learner is so far Master of it as to be out of all Danger of forgetting it.

Before I conclude the Article of Bowing, I must caution the Learner against marking the Time with his Bow; for if he once accustoms himself to it, he will hardly ever leave it off. And it has a most difagreeable Effect, and frequently destroys the Design of the Composer. As for Example, when the last Note in one Bar is joined to the first Note of the next by a Ligature, those two Notes are to be played exactly in the same Manner as if they were but one, and if you mark the beginning of the Bar with your Bow you destroy the Beauty of the Syncopation. So in playing Divisions, if by your Manner of Bowing you lay a particular Stress on the Note at the beginning of every Bar, so as to render it predominant over the rest, you alter and spoil the true Air of the Piece, and except where the Composer intended it, and where it is always marked, there are very few Instances in which it is not very difagreeable.

N. B. In the twentieth Example the Word Buono, fignifies Good; Mediocre, Middling; Cattivo, Bad; Cattivo, o Particolare, Bad or Particular; Meglio, better; Ottimo, very good; and Pefimo, very bad.

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\underbrace{2^{a}}_{4\ 3\ 2} \underbrace{1^{a}}_{4\ 3\ 2} \underbrace{2^{a}}_{4\ 3\ 2\ 1} \underbrace{1^{a}}_{4\ 3\ 2} \underbrace{2^{a}}_{4\ 3\ 2\ 1} \underbrace{2^{a}}_{4\ 3\ 3}$ <u>a</u> 1212 12123  $E_{4^a}$ 00000 <u>1</u>a  $\begin{array}{c} 2^{a} 1^{a} \\ \overline{434} \\ \overline{323} \\ \overline{434} \\ \overline{323} \\ \overline{323} \\ \overline{434} \\ \overline{323} \\ \overline{434} \\ \overline{434} \\ \overline{4234} \\ \overline{434} \\ \overline{434} \\ \overline{21234} \\ \overline{434} \\ \overline{21234} \\ \overline{23234} \\ \overline{341234} \\ \overline{341234} \\ \overline{12} \\ \overline{12} \\ \overline{34} \\ \overline{12} \\ \overline{12}$ 0000 341234 ,a 231234  $\begin{array}{c} 3 & 2 & 3 & 2 & 3 & 4 \\ \hline 3 & 2 & 3 & 2 & 3 & 4 \\ \hline 3 & 2 & 3 & 2 & 3 & 4 \\ \hline 0 & 0 & 0 & 0 & 0 & 0 \\ \hline 0 & 0 & 0 & 0 & 0 & 0 \\ \hline 0 & 0 & 0 & 0 & 0 & 0 \\ \hline \end{array}$  $\begin{array}{c} 34234 \\ \hline 0 \\ \hline 0 \\ \hline \end{array} 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\\ \begin{array}{c} 34234 \\ \hline \end{array} \\ \hline \end{array} \\ \begin{array}{c} 34234 \\ \hline \end{array} \\ \hline \end{array} \\ \begin{array}{c} 34234 \\ \hline \end{array} \\ \hline \end{array} \\ \begin{array}{c} 34234 \\ \hline \end{array} \\ \hline \end{array} \\ \begin{array}{c} 34234 \\ \hline \end{array} \\ \hline \end{array} \\ \begin{array}{c} 34234 \\ \hline \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} 34234 \\ \hline \end{array} \\ \end{array} \\ \begin{array}{c} 34234 \\ \hline \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} 34234 \\ \hline \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} 34234 \\ \hline \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} 34234 \\ \hline \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} 34234 \\ \hline \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array}$ 34234 434234 00000  $\frac{4^{3}}{5^{3}}\frac{4^{3}}{4^{3}}\frac{3}{5^{3}}-\frac{2^{3}}{5^{3}}\frac{3^{2}}{5^{3}}\frac{2^{3}}{5^{3}}-\frac{1^{3}}{5^{3}}\frac{2^{3}}{5^{3}}\frac{1^{3}}{5^{3}}-\frac{1^{3}}{5^{3}}\frac{2^{3}}{5^{3}}\frac{1^{3}}{5^{3}}\frac{2^{3}}{5^{3}}\frac{1^{3}}{5^{3}}\frac{2^{3}}\frac{2^{3}}{5^{$ 4ª 3ª 4ª 3ª 2ª 2ª 3ª 2ª 1ª 2ª 1ª 2ª 1 34 4 4 1 4 1 4 1 4 1 0000 +000000 -----90 00

2 Efsempio II. 0 0#0 9  $\begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \end{array}{\phantom{a}} \\ \end{array}{\phantom{a}} \end{array}{\phantom{a}} \\ \end{array}{\phantom{a}} \end{array}{\phantom{a}} \\ \end{array}{\phantom{a}} \end{array}{\phantom{a}} \\ \end{array}{\phantom{a}} \end{array}$  } \end{array}{\phantom{a}} \end{array} } \end{array}{\phantom{a}} \end{array} } \end{array}{\phantom{a}} \end{array}} \end{array}{\phantom{a}} \end{array}} \end{array}{\phantom{a}} \end{array}} \end{array}{\phantom{a}} \end{array}} }} }}}}}}}}}}  $\begin{array}{c} \begin{array}{c} 2^{a} & 1^{a} \\ \hline 0 & 1 & 2 \\ \hline 1 & 2 & 1 & 2 \\ \hline 1 & 2 & 1 & 2 \\ \hline 1 & 2 & 1 & 2 \\ \hline 1 & 2 & 1 & 2 \\ \hline 1 & 2 & 1 & 2 \\ \hline 1 & 0 & 1 & 0 \\ \hline 1 & 0 & 1 & 0 \\ \hline 1 & 0 & 1 & 0 \\ \hline 1 & 0 & 1 & 0 \\ \hline 1 & 0 & 1 & 0 \\ \hline 1 & 0 & 1 & 0 \\ \hline 1 & 0 & 1 & 0 \\ \hline 1 & 0 & 1 & 0 \\ \hline 1 & 0 & 1 & 0 \\ \hline 1 & 0 & 1 & 0 \\ \hline 1 & 0 & 1 & 0 \\ \hline 1 & 0 & 1 & 0 \\ \hline 1 & 0 & 1 & 0 \\ \hline 1 & 0 & 1 \\$  $\begin{array}{c} \overbrace{3}^{I^{a}} & \overbrace{0}^{I^{a}} &$ 

Efsempio III. 3 3a 50 00 0 to toboobo <del>bobo C</del> EfsempioN 12 1112 1112 ma mi З, 0100000 bΟ  $I_{\widehat{ma}}^2 \xrightarrow{3}_{ma}^4$ з  $\frac{2}{ma}$ ma ma oi mi  $\begin{array}{c} 2^{a} & 1^{a} \\ \hline 1 & 2 & 3 & 2 & 3 \\ \hline 1 & 2 & 3 & 2 \\ \hline 1 & 2 & 3 & 2 \\ \hline 1 & 2$ <u>4</u>ª 000000000 З eloic 3 4 1 2 3 4 ma ma po po 3 Í ma mi Ia 3 1010 8ª З 





## Essempio VIII









## Essempio IX





## Essempio X





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## Efsempio XI





# Elsempio XII









# Efsempio XV.















# Efsemp.XVIII


## Esempio XX







## Elsemp.XXII



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 $\frac{1}{2} - \frac{1}{1} + \frac{2^{a}}{3} - \frac{1}{2} + \frac{2^{a}}{3} - \frac{1}{2} + \frac{2^{a}}{3} - \frac{1}{3} + \frac{2^{a}}{2} - \frac{1}{3} + \frac{2^{a}}{2} - \frac{2^{a}}{3} - \frac{2^{a}}{3$ 

5.  $\frac{3^{2}}{32}$   $\overline{2}$   $\overline{1}$   $\overline{3}$   $\overline{2}$   $\overline{10}$   $\overline{4}$   $\overline{32}$   $\overline{12}$   $\frac{2^{2}}{3^{2}}$   $\frac{3^{2}}{21}$   $\overline{12}$   $\frac{2^{2}}{3^{2}}$   $\frac{3^{2}}{21}$   $\frac{2^{2}}{21}$   $\frac{3^{2}}{4}$   $\overline{32}$   $\overline{12}$   $\overline{12}$   $\frac{2^{2}}{4}$   $\frac{3^{2}}{32}$   $\overline{12}$   $\frac{2^{2}}{21}$   $\frac{3^{2}}{32}$   $\overline{12}$   $\overline{12}$   $\frac{2^{2}}{3^{2}}$   $\frac{3^{2}}{21}$   $\frac{2^{2}}{32}$   $\overline{12}$   $\frac{3^{2}}{32}$   $\overline{12}$   $\frac{2^{2}}{32}$   $\frac{3^{2}}{32}$   $\overline{12}$   $\frac{2^{2}}{32}$   $\frac{3^{2}}{32}$   $\overline{12}$   $\frac{2^{2}}{32}$   $\frac{3^{2}}{32}$   $\overline{12}$   $\frac{3^{2}}{32}$   $\overline{12}$   $\frac{3^{2}}{32}$   $\overline{12}$   $\overline{12}$ 























**#**\*3 6 § \*3 <u>98</u> 























## Compof."XI.







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