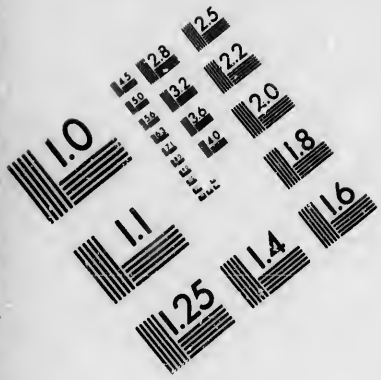

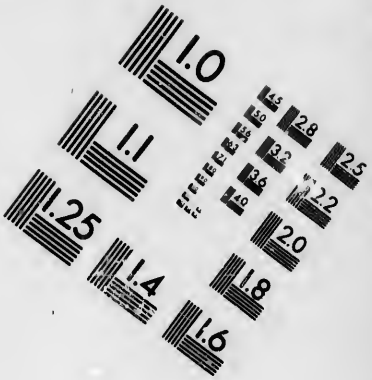

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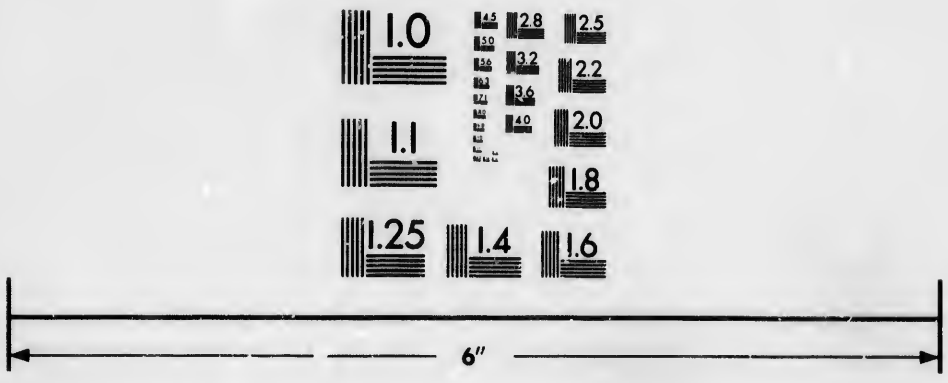

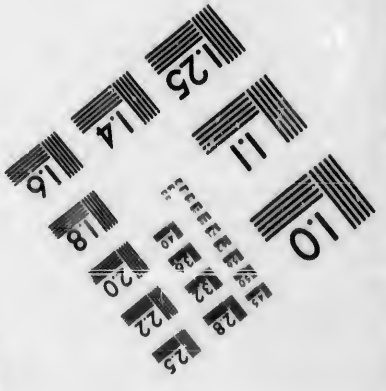

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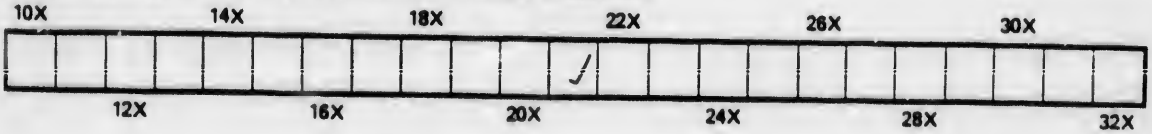

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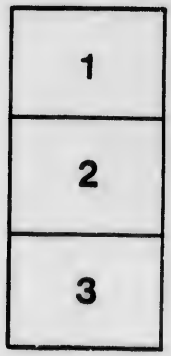

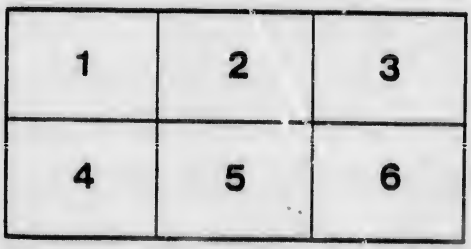

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EXAMINATION PAPERS

OF

THE CORNWALL COUNTY

GRAMMAR SCHOOL.

JUNE, 1861.

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ST. NICHOLAS STREET, MONTREAL.

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1861.

Cornwall County Grammar School.

Head Master.—Rev. H. W. DAVIES,
M.A., Trin. Coll., Toronto.

Assistant Master.—H. WILSON,
Victoria College, Cobourg.

Mathematical Examiner.—ANGUS HAY, Esq.,
Normal School, Toronto.

Cornwall County Grammar School.

ORDINARY EXAMINATION.

LATIN COMPOSITION.

In the famous case of Catiline's conspiracy, as the evidence was clear and the danger extreme, the accomplices in it were executed notwithstanding the Porcian law; and this was done by order of the Senate, without either hearing them make their own defence or admitting them to claim the right which the Valerian law gave them, of an appeal to the people. Yet that whole proceeding was chiefly directed by the two greatest asserters of public liberty that ever lived—Cato and Cicero; and Cæsar, who opposed it on pretence of its being against the Porcian law, was for that reason suspected of being in the conspiracy.

LATIN.—II.

OVID'S FASTI. B. 1.

1. Translate 45—62. Explain *Tria verba. Septis, qui nono . . . . . redit.* Construction of *officii.* Give the divisions of the Roman month, with the derivation of their names. Write out in full and give the corresponding days in our calendar:

Prid. Id. Jan.
A.D. xix. Kal. Feb.

2. Translate 89—112. With notes on *Jane bi*
Chaos. aër. Conjugate *edo, disco, cano, abeo,* and

3. Translate 587—616. Explain *atria, ceras, notam, querna corona.*

4. Translate 709—724. Why is 30th day of the month written III. KAL. Explain *Frondibus Actiacis, tuba, perennet.*

5. Translate and explain:

Sustinet in vidua tristia signa domo.
Farraque mixta sale. Ora vides
Hecates in tres vergentia partes.
Janus *Agonali* luce piandus erit.
Traxerat aversos Cacus.

Scan lines 520—524.

LATIN.—III.

OVID AND VIRGIL.

Certamen inter Ajacem et Ulyssem de armis Achillis.

1. Translate 34—42. Explain *nulloque sub indice*, and give principal parts of the verbs.

2. Translate 238—246. State difference between *aut* and *vel*. Distinguish between *sors* and *fors*.

3. Explain the following, with grammatical construction of those marked *

Saxum grave Sisyphon urget. Te . . . expositum Lemnos haberet. Quo successore sagittæ Hereulis utuntur. Verus furor (giving Greek equivalent for *verus* and *verax*). Fictum crimen. Resupinum. Manifestabit latentem. Proavos and pronepos (with ascending and descending scale.) Deus est in utroque parente. Natam mactare Dianæ. Vulnera ipso pulchra loco. *Pretio objecta. *Sis licet. Eripere *æde Deam. Tentoria Rhesi. Quos *hosti nuper ademi. Ex præcipiti petendum.

4. Write short notes on the following names: Telamon. Pœantia proles. Palamedes. Dolon. Cyllenius. Menelaus.

VIRGIL.

5. Sketch the adventures of Æneas as contained in the First Book of the Æneid.

6. Translate B. I. 131—141. Explain the terms *aposiopesis* and *hendiadys*. Distinguish between *fides* and *fiducia*, *carcer* and *carceres*.

7. Translate 172—194. *Ipsa*, what is the force? *Numen* what? *Extemplo* derivation? Explain *antiqua sub religione*. Distinguish between *ultro* and *sponte*.

8. Translate B. II. 200—227. Give grammatical construction of *oculos*. Distinguish between *clypeus*, *parma*, and *scutum*.

9. **Translate the following, and explain grammatical construction of the words in italics:**

Me ne incepto desistere. Septem præstanti *corpore* nymphæ. Levat ipse *tridenti*. Oscula libavit natæ. Nec vox *hominem* sonat. Et multo nebulæ circum dea fudit *amictu*. *Auro* corpus vendebat. Non metus officio ne *te* certasse priorem pœniteat. Non *opis* est nostræ. Vina coronant. *Instar* montis equum. Inclusos utero Danaos et pinea furtim laxat claustra Sinon. Explain this construction.

10. Parse the following words: Pergama, æthera, instamus, implicat, digerit. Give the synonyms of the following, with their meanings: Memini, dives, mens, templum, ensis, accipio, and opperior. Give the adverbs derived from *hic* and *ille;* and distinguish between *sic* and *ita*.

11. Why is the metre called HEXAMETER? What is a spondaic line? Scan lines 1, 2, 3, and 93, Book II., explaining *synalœpha*.

LATIN.—IV.

SALLUST AND CICERO.

1. Translate CATILINA Ch. LI. Omnis—fecêre, giving the synonyms of *animus*. Explain *genus pœnæ novæ*, and explain LEX PORCIA.

2. Translate Ch. LII. Quare—possidet.

3. Translate Ch. LVIII. Si relinquere—relinquatis; and give the government of *pace*.

4. Parse the following words: *pecora, prætoria, conciderant, occiderant, illexerat, capessite.*

Explain the following, and distinguish between the synonyms: *Patiens inediæ, paries, celebrare, evocati, potentia, gaudium, egestas, delubra, repudiare, maria constructa, vigiliæ, ante diem sextum, a patribus secessit.*

5. Give the divisions of the Roman month, derivation of names, and express in Latin form, June 3, 10, 29, 30.

6. Translate CICERO IN CATILINAM, Ch. I. Quousque—venit, explaining *immo—vero*, and giving derivation of *immo*. Ch. II. *Cupio—molientem*; why *me ipse* and not *me ipsum?* Conjugate *molior, mollio*, and *molo*.

7. Translate Ch. VII. Nullum—desinam; with notes.

VIRGIL AND HORACE.

1. Translate B. VI. 868—886.

2. Translate Odes B. I. XXII. 1—16. XXVIII. 7—15, explaining allusion in *Panthoiden*. XXXIV. 1—12, with notes on *sapientiæ, Diespiter, per purum tonantes.*

3. Ode XXXV. Give the 4 objects in respect of which Fortune is here invoked. Explain *rara* Fides velata *panno; nova incude diffingas.*

4. Book III., II. 17—24. III. 45—52. XII. 1—12.

5. Mention other readings, arguing in favour of the one adopted. Nunquam dimoveas. Siccis oculis. Curis expeditis. Veris inhorruit adventus foliis. Hac arte enisus. Cohortes addidit oppidis. Arma decepta vidi.

6. Translate literally and explain the grammatical forms: Nube candentes humeros amictus. Debes Virgilium et finibus Atticis reddas in columem. Scriberis Vario. *Pignus* que dereptum lacertis. Quinta parte sui nectaris imbuit. Multi Damalis meri. Audax perpeti. Nisi ventis debes ludibrium. Lucretilem mutat Lycæo. Quæ virginum barbara?

7. Explain, with notes on the words in italics: Partem *solido* demere de die. Tabula votiva . . . . suspendisse. . . vestimenta. Pastor quum traheret. *Quîs* sub Arcto rex gelidæ metuatur oræ. Quanta Charybdi. Triformi chimæra. Injecto ter pulvere. Arabum invides gazis. Mutatæque simul togæ. Amystide. *Classe cita reparavit* oras. Cui.....cervice pendet. *Cæmenta* demittit redemptor. Murus aëneus *Auctore* Phœbo. Carmine perpetuo. Philippis versa acies. Capitis minor. Martiis cælebs quid agam Kalendis. Nexæ philyra *coronæ*. Impotens sperare. Sine funibus. Præsens divus. Improbæ divitiæ. Tribus aut novem miscentur *cyathis* pocula commodis. Tres prohibet *supra* ....tangere *Gratia*. Si *cadit* hædus.

8. Give the Greek expressions for: Eryeina ridens. Urit. Gravem stomachum. Favere linguis. Ducere succos.

9. Write out scales for the following metres:
Asclepiadic. Do. ἀσυνάρτητοι. Archilochian. Pherecratian.

LATIN.—V.

CICERO AND LIVY.

1. What objections were made to the passing of the Manilian law? By whom were they principally urged, and how does Cicero answer them?

2. Translate Cap. III., with notes on: Mithridatico bello superiore; uno die; vestigalibus; insignia victoriæ. Distinguish between *ceteri* and *reliqui*, *mercator* and *negotiator*, *recipere* and *excipere*. Who were the *publicani?*

3. LIVY B. I. Translate CAP. VII. *Palatium*—occubuit. CAP. XXIV. *Fœdera* to end, with notes on *fetialis*, *pater patratus*, *sagmina*, and *dolo malo*.

HORACE AND TERENCE.

4. Translate SAT. I. 3, 69—75, 83—89. Explain *Cum tristes venere Kalendæ. Evandri manibus tritum.* Sat V. 25—36. Parse *pransi*, *illinere*. Explain *ad unguem factus homo*, quoting a similar expression from ARS POETICA.

5. ARS POETICA. Translate 125—135. Explain *amphora urceus*, *Æmilium circa ludum faber unus*, *regis opus*, *soccus* and *cothurnus*. *Vos plaudite*, *facundia præsens*, *orichalco*, *personæ pallæque*, *magnum loqui*. *Vel qui prætextas vel qui docuere togatas.*

6. Give a brief sketch of the plot of this play (ANDRIA). Translate ACT III., IV. 1—15. Translate ACT V. 6. Explain *animum appulit*, *immemoris beneficii*, *habet*, *symbolam dedit*, *percussit illico animum*, *sedulo*, *veterator*, *arcessere* and words formed in the same way. *Concrepuit ostium*, *sycophantam*, *extemplo.*

ANCIENT HISTORY.

1. Name the 7 kings of Rome, with the chief incidents that marked their respective reigns.

2. Give the history of the formation of the Consulate, mentioning the qualifications subsequently required to attain to that office.

3. Explain the nature of the *ager publicus*.

4. Give a brief sketch of the Samnite Wars.

5. Give a brief sketch of the constitution of Lycurgus.

6. Compare the constitutions of Solon and Servius Tullius.

ANCIENT GEOGRAPHY.

1. Describe geographical position of Italy and Greece, with their ancient divisions and physical appearance. Trace the principal rivers of Italy.

2. Give the position of the following places, mentioning for what they are famous:—Fæsulæ, Patavium, Laurentum, Lanuvium, Brundusium, Venusia, Formiæ, Cales, Mons Massicus, Palinurum, Antium, Delphi, Tempe, Mons Lycæus, Hymettus, Mycenæ.

GREEK IV.— { EURIPIDES—MEDEA. / XENOPHON—MEMORABILIA, B. I.

1. Sketch the plot of this play. Translate 66—94. Explain the formation of ἐλᾷν. Distinguish between εἰ καὶ and καὶ εἰ. Illustrate the use of πριν with the perfect, aorist, and present infinitive.

2. Translate 273—293. Parse ἐξίασι and ἐξιᾶσι. Distinguish between ἐρετμῆσαι and ἐρετμῶσαι; βωμὸς, ὅρκος and πίστις. Give construction of κρύπτω, and compare that of *celo*. Distinguish between σινήδομαι and ἐφήδομαι. Express in Latin κάκιστος ἀνδρῶν ἐκβέβηκε.

3. Translate Memorabilia Cap. I. 2 and 3, 17—20. Conjugate ὄμνυμι, ἀποκτείνω, φυλάσσω, σημαίνω, νομίζω. Cap. II. Translate 24 and 25. Explain γράφεσθαι τινα, γραφή, φῆμαι, σύμβολα, θυσιαι, πλήθουσα ἀγορά. By what names did Socrates call his followers?

GREEK III.— { XENOPHON.—ANABASIS, BOOK I.
HOMER.—ILIAD, BOOK I.
GREEK TESTAMENT.—ST. JOHN'S GOSPEL

1. Translate Cap. II. 1 and 2, parsing the following words: *ἐποιεῖτο, συναλλαγέντι, προεστήκει, ἔμειναν.*

2. Translate with notes Cap. III. 3 and 4. Explain the following words: *ξένος, δαρεικός, πλέθρον, παρασάγγης, στάδιον, σταθμός, στλεγγίδες, πετραι ἠλίβατοι, ὄνους ἀλέτας, σίγλος, ὀβολὸς, χοῖνιξ.* Parse *κατεθέμην, ἐδαπάνων, ὠφελοίην.*

3. Translate Cap. IX. 7—9. Conjugate *καταπέμπω, ἀποδείκνυμι, ὑπισχνέομαι, σπένδω, προΐημι, ἀνδάνω.*

4. Explain these constructions: *διαβάλλει ὡς ἐπιβουλεύοι. εὐνοϊκῶς ἔχοιεν πόλεων ὧν ..... ἔχων.* Distinguish between *ἀποδιδράσκω* and *ἀποφεύγω. ἄρχειν* and *ἄρχεσθαι τοῦ λογοῦ*, with Latin idiom for the former. *τουτονί*, explain *ί* and give corresponding Latin and French form of pronoun. Give the adverbial affixes denoting *motion to* and *from*, and *rest in a place*, and translate into Greek *here, hence, hither, then, there, thence, thither.*

5. Translate Hom. Iliad I. line 130—147, and give the parts of *πείθω, βαίνω, δίδωμι*, and *αἴρεω*. Explain *αὐτούς* line 4. *τέ—καί, μη κιχείω, πρίν* with conjunctive and optative, *causal* and *relative* genitive, *ἐπὶ φρεσὶ θῆκε, ἄρα* and *ῥα, Dativus incommodi*; position of *μέν* and *δὲ*. When is a question introduced by *ἤ*? Distinguish between accusative of *cognate* and *equivalent* notion, and name the other accusatives of this class.

6. Translate St. John's Gospel, Cap. I. 35—43. *ὥρα δέκατη.* What hour? *τὸν Μεσσίαν.* Explain use of article. Translate Cap. VI. 52—59. Explain the omission of the article with *πίνων.* Translate Cap. VIII. 44—47. Give the two translations of the latter part of verse 44. Distinguish between *ἐλέγχω* and *ἐπιτιμάω.*

7. Translate *ἐσκήνωσεν ἐν ἡμιν. καὶ χάριν ἀντὶ χάριτος. τοὺς πωλοῦντας βοας*; how do you account for the omission of the article with the nouns, while two of the Evangelists insert it? *κερματιστὰς* who? Give its derivation. *οἴδαμεν ὅτι ἀπὸ Θεοῦ ἐλήλυθας διδάσκαλος. σὺ εἶ ὁ διδάσκαλος.* Explain the use of the article. Distinguish between *ποῖεω* and *πράσσω.* Translate *τὸ ὕδωρ τὸ ζῶν. πνεῦμα ὁ Θεός. ὁ λόγος ἐστιν ὁ ἀληθινὸς*, why not *ἀληθης*? Distinguish between *λαλία* and *λόγος.* What force has *μὴ* as an interrogative? Give interpretation of Ῥαββι, Σιλωάμ, Κηφᾶς, Βηθεσδα. Explain *ὕψωσε τὸν ὄφιν. ὁ προφήτης, ὁ ἀρχιτρίκλινος, οὐ Μωϋσῆς δεδωκεν ὑμῖν τὸν ἄρτον ἐκ τοῦ οὐρανοῦ.*

GRAMMAIRE FRANÇAISE.

1. Comment appelle-t-on le verbe lorsqu'il se présente sous sa forme *simple?*

2. Combien de sortes de *temps* dans les verbes, et en quoi se divisent-ils?

3. Comment se forme l'imparfait du *subjonctif?*

4. Quelle différence fait on entre *ou* conjonction et *ou* adverbe?

5. Qu'est-ce que la *cédille?*

6. Combien y a-t-il de parties dans l'analyse logique?

7. De quel genre sont *amour*, *délice* et *orgue?*

8. De quel genre est *foudre?*

9. Quand emploie-t-on simplement *de* au lieu de l'article devant le substantif?

10. Quelle différence y a-t-il entre *un homme brave* et *un brave homme?*

11. Quelle est la règle du participe passé employé avec l'auxiliaire *être?* Du participe passé employé avec avoir?

12. Quand *même* est-il adverbe?

Analyse grammaticale.

Parmi les productions naturelles, qui par les relations de l'Europe avec l'Orient ont été transportées dans nos climats se trouve une fleur que les Turcs appellent *Tulibant*, et qui en Europe a reçu le nom de *Tulipe.*

VERBE *Courir*, 2ème Conjugaison.

Traduction de Charles XII, (par Voltaire).

Page 30. *Depuis le second paragraphe jusqu'au troisième.*

FABLE DE PERRIN.

LA TULIPE ET LA ROSE.

Traduction de l'Anglais en Français.

Lofty mountains, who has established you on your foundations? who has raised your heads, even above the skies? who has decked you with verdant forests, with fruit trees, with these plants so useful and so varied, with so many agreeable flowers?

SUBJECTS FOR ENGLISH MEDAL.

ENGLISH GRAMMAR.

1. Distinguish (according to Morell) between a *syllable* and a *vowel.*

2. Give his divisions of COMMON and ABSTRACT NOUNS.

3. Form 3 sentences containing *common* nouns, and change them into corresponding abstract ones.

4. Classify the CONJUNCTIONS and give the rule for determining whether a word is an *adverb, preposition,* or *conjunction.*

5. *a.* Classify the AUXILIARIES, and explain the composition of this sentence "I will go."

b. Write out 6 verbs that cannot have a *passive* voice.

c. Write out a sentence containing an *intransitive* verb, implying an *active* state.

d. Give the present and past indicative of *run* in the *progressive* and *emphatic* forms.

e. Define the MIDDLE VOICE and give an example.

6. Give the rule respecting adverbs, and state which is the correct expression, "The queen looks majestic" or "majestically."

7. Apply rules to the following examples, and parse the words in italics:

The people were divided. *Spring* coming, the swallows appear. O *Death* where is thy sting? A play *of* Shakspere's, the great *poet.* I watched three *hours.* I was asked that *question* yesterday. He gave *me* a *book.* Satan, than *whom* none higher sat.

8. *a.* Define a sentence, Subject, Predicate, Copula, Completion and Extension of Predicate.

b. Distinguish between a *complex* and *compound* sentence.

c. What do you mean by *adjuncts?*

9. Analyze the following passages and parse etymologically the words in italics:

If death were nothing, and *nought* after death;
If, when men died, at once they ceased to be;
Returning to the barren womb of nothing
Whence first they sprung, then *might* the debauchee
Untrembling, mouth the heaven.

Some dream that they can silence, when they *will*
The storm of *passion* and *say* "*Peace, be still;*"
But "thus far and no further," when addressed,
To the wild waves, or wilder human breast,
Implies authority, which never *can,*
And never ought to be the *lot* of *man.*

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10. According to analysis of sentences, deduce rules for punctuation.

ENGLISH LANGUAGE.

1. Define *language* and disprove the assertion that language has attained its present position by a gradual process of development, and prove that it is more than a mere "accident of human nature."

2. How does language prove man to be of divine origin?

3. Give the grand divisions of the 2 great branches of the Gothic language.

4. Of what is the ANGLO-SAXON language composed, and give a short sketch of the origin of the language?

5. Had the Danish invasions any effect upon the language of Britain, and if any what was it?

6. Trace the introduction and spread of the NORMAN FRENCH language in Britain.

7. Give Craik's division of the different periods of English literature.

8. State Trench's rule for knowing whether a word comes *mediately* or *immediately* from the Latin.

9. Illustrate, by examples, the difference between *apocope* and *syncope;* and state what changes take place in the vowels.

10. What do you mean by "double adaptation"? Give examples.

11. What advantage does the literature of Greece or Rome possess over ours?

12. Adduce instances to prove the deterioration of language, and quote passages containing the words in their original sense.

13. Give the derivation of the following words, and remark upon those in italics: Accomplice, Affect, *Affront*, *Angel*, *Antic*, *Art*, (embracing *Cunning* and *Craft*), *Ambition*, *Asperse*, Astonish, *Astronomy* and *Astrology*, *Candidate*, *Saunter*, *Assassin*, Poltroon, *Tribulation*, *Pagan*, *Heathen*, Calamity, Vapid, Eliminate, Imbecile, Plague, Sincere, Odd, *Miscreant*, Mob.

14. Give instances of words now used in the English language, that have been introduced by means of intercourse with other nations.

NATURAL PHILOSOPHY.

1. Distinguish between a *law* and a *property*. Mention the different divisions of Natural Philosophy, and define the following terms:—*Gravity*, *Inertia*, *Compressibility*, and *Elasticity*.

2. State and illustrate the different kinds of motion. Prove by examples, the truth of the formulæ for finding S, T, and V.

3. State the 3 Laws of Motion and describe Atwood's Machine.

4. State the propositions respecting bodies projected *upwards* and *downwards* with a given velocity.

5. State and prove the *Parallelogram*, *Polygon* and *Triangle* of Forces.

6. Define the *Centre of Gravity*, and how it may be found by experiment. Define *projectile* and *random*. When is the *random* greatest in *theory* and *practice*?

7. Deduce formulæ for shewing the relation between P and W in each of the Mechanical Powers.

In a compound lever, the short arms are respectively $\frac{1}{2}$, 1, and 2 feet; the long arms 4, 6, 8; a power of 2 lbs. is exerted at the end of the longer arms. What weight can be raised?

8. Explain the action of carriage wheels in overcoming *obstacles*, and illustrate by means of a figure.

9. Investigate and apply to each of the Mechanical Powers the *general* law which applies to them all.

10. Explain the following terms:—*regulators*, *rectilinear*, *rotary*, and *recip·ocating* motion, *spur* and *bevel gearing*.

11. Define the following:—*Fly wheel*, *Universal Joint*, *Rachet Wheel*, *Eccentric Wheel*.

12. What is the practical use of the *Pendulum*?

State the 5 conclusions respecting *Friction*, and explain *Friction Wheels*.

GEOGRAPHY.

1. Define Physical and Political Geography.

Give position and extent of the ZONES: and state the influences that modify the temperature of a place.

2. Name the Zones of Vegetation, with the characteristic plants of each.

3. Classify the Rivers and Lakes on the surface of the Earth; and describe the great EQUATORIAL CURRENT.

4. Describe the causes of the Tides: and describe 8 different Phases of the Moon.

5. Mention the 5 Divisions of the Human Family; and how are they distributed?

6. Describe the Physical Divisions of North and South America.

7. Mention the Empires and Kingdoms of EUROPE. Describe its physical divisions; name and give position of its principal Seas, Bays, Straits and Rivers, with the Countries which they drain.

8. Name the 6 Northern Counties of ENGLAND, mentioning the Chief Towns and also for what they are noted.

9. Describe the Physical Features and Natural Divisions of ASIA, and trace the Indus, Ganges, and Amoor.

10. Mention the General Divisions of NORTH and SOUTH AMERICA, with their respective positions. What rivers drain the Eastern and Western slopes of North America?

11. Mention the ancient Divisions of EUROPE. State position of Mesopotamia, Syria, Asia Minor, with any famous cities in them.

12. State position of Newcastle, Canterbury, Manchester, Coventry, Rouen, Aix-la-Chapelle, Constantinople, Corunna, Moscow, Bombay, Palermo, Palmyra, Cabul, Aden, Trinidad; mentioning anything interesting respecting them.

FRENCH HISTORY.

From the Accession of Louis XV, A. D. 1714 to the Treaty of Amiens, 1802.

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1. Give an account of the Mississippi Scheme; the war of the Austrian Succession; and state briefly what you know of Maurepas, Turgot, Malesherbes and Necker.

2. Sketch briefly the characters of Maria Antoinette and Louis XVI; and describe fully the Notables and the Farmer-Generals.

3. Describe fully the States-General of France, the Verification of Powers and the National Assembly.

4. Describe the Sections, the National Guard, and the taking of the Bastile; and explain the system of Assignats; with a full description of the great changes effected by the Assembly.

5. Give a brief description of the Girondists, the massacres in the prisons, and the trial and execution of the king.

6. State briefly what you know of the following;—The Clubs, Egalité, the Maximum, the Girondists, and the war in La Vendée.

7. Give the characters of Robespierre, Marat, and Danton, and describe briefly the Reign of Terror and the fall of the Terrorists.

8. Describe briefly the state of France at the death of Robespierre, and give a sketch of the Directory, Napoleon, the Italian War, and the Expedition to Egypt.

9. Sketch briefly the characters of Fouché, Talleyrand and Sieyes.

10. Describe fully the Council of Five Hundred; the Consulate; the Passage of the Great St. Bernard; and give a short account of the battle of Marengo, and the Treaty of Amiens.

SUBJECTS FOR MATHEMATICAL MEDAL.

ARITHMETIC, I & II.

1. Explain fully by examples the four simple rules, and show how they may be resolved into two.

2. Give the rules for the following, with examples:—Minuend and Difference given, to find Subtrahend; Product and one Factor to find the other; Divisor and Quotient to find Dividend; Dividend and Quotient to find Divisor.

3. State and prove by examples the four general principles of Division.

4. Define *Reciprocal*, *Measure*, *Multiple*, and prove fully the rule for finding the *G. C. M.* and *L. C. M.*

5. Give full definitions, with examples, of all the different kinds of Fractions; explain the use of Numerator and Denominator; and prove fully the rules for the following:—To reduce an Improper Fraction to a *whole* or *mixed* number, and the opposite; to reduce Fractions to their lowest terms, and when are Fractions so reduced?

6. Prove fully the rules for the Addition, Subtraction, Multiplication, and Division of Common Fractions in *all* the cases which can arise.

7. Define Decimal Fractions, with examples; explain their system of Notation and Numeration, and how they are more convenient than Common Fractions.

8. Define a *Repetend*, explaining the different kinds, and the manner of reducing them to their equivalent Vulgar Fractions; and find the value of $\cdot 4\dot{1}\dot{2}\dot{3}$. Prove the rule for Multiplication and Division of Decimals.

9. Give and prove fully the rules for the Reduction, Ascending and Descending, of Decimal and Composite Numbers.

10. Add together $\frac{4\frac{1}{2}}{1\frac{7}{6}}$, $\frac{1}{4}$ of $3\frac{3}{1}$ of $\frac{1}{1\frac{4}{5}}$ of $2\frac{1}{4}$, and $\frac{20\frac{3}{4}}{7\frac{9}{1}}$. Find the value of $\frac{1}{2}$ of $\frac{3}{7}$ of $\frac{3}{5}$ of $8\frac{1}{4}$ of $\frac{10\frac{2}{6}}{6\frac{3}{5}} - \frac{17\frac{9}{11}}{1\frac{1}{3}\frac{3}{3}}$. Find the value of $\frac{27}{37\frac{1}{8}} \times \frac{87\frac{3}{9}}{98\frac{1}{8}} \times \frac{\frac{7}{8}}{2\frac{1}{3}} \times \frac{81\frac{9}{11}}{128}$. Divide $\frac{9}{1\frac{1}{7}}$ of $\frac{4}{1\frac{1}{7}}$ of $\frac{8\frac{1}{2}}{1\frac{3}{1}} \times 3\frac{1}{7}$ by $\frac{1}{1\frac{1}{7}}$ of $\frac{9\frac{1}{2}}{8\frac{1}{4}} \times 4\frac{3}{8}$.

11. Supposing a meteor should appear so high that it could be seen at once by the inhabitants of Boston 71° 3′, of Washington 77° 43′, and of the Sandwich Islands 155°, west longitude; if the time be 47 minutes past 11 o'clock of December 31st, 1860, at Washington, what will be the time at Boston and at the Sandwich Islands?

ARITHMETIC.

1. Define VULGAR and DECIMAL FRACTIONS, and prove fully the rules for the Addition, Subtraction, Multiplication, and Division of *each*. Define the different kinds of RATIO, and PROPORTION. Prove fully that product of means equals product of extremes; and the rule for finding any term of a Proportion, *three* being given.

2. Define ALLIGATION MEDIAL and ALTERNATE, and prove the rule for the solution of questions in Alligation *Alternate*. Explain EXCHANGE, giving the *nominal* and *commercial* values of the pound sterling, and explain the expressions *at par*, *at a premium*, *at a discount*.

3. Define, with examples, INVOLUTION and EVOLUTION. Shew that the cube of every number of n digits has either $3n - 2$, $3n - 1$, or $3n$ digits; and hence deduce the rule for pointing in the Cube root. Extract the Cube root of 1860867, and explain fully the several steps in the process.

4. Define ARITHMETICAL and GEOMETRICAL PROGRESSION. Explain the different terms employed, and deduce an algebraic formula for each letter in both kinds of Progression.

5. Distinguish between PERMUTATIONS and COMBINATIONS, and prove fully the formulæ for n things taken 2, 3, 4, and r at a time, and hence for n things taken all together.

6. Define the following: — PARALLELOGRAM, RHOMBUS, RHOMBOID, TRAPEZOID, TRIANGLE, CIRCLE. Give and explain fully the rules for finding their areas.

7. Solve the following:—How many cubic miles in the Earth? What are the solid contents of a pyramid whose base is 4 feet square, and the perpendicular height 9 feet? How many wine-gallons in a cask the bung-diameter of which is 36 inches, the head-diameter 27 inches, and the length 45 inches?

ALGEBRA.

1. Define a FRACTION. State and *prove* the rule for the Multiplication and Division of one Fraction by another.

2. State your reasons for preferring the expressions H. C. M. to G. C. M. Investigate the rule for finding L. C. M.

3. State the difference between an *identical equation* and a *conditional equation.* What do you mean by the *dimensions* of an equation? Prove the truth of the rule respecting *Transposition.* Prove that an Equation of the first degree can have only *one* root.

4. Define *simultaneous* equations. State the three methods of solving them, and apply them to the example

$$4x + 3y = 22;\ 5x - 7y = 6.$$

5. Investigate the rule for extracting the square root of an Algebraical quantity, and apply it to the example

$$4x^4 - 12x^3 + 5x^2 + 6x + 1.$$

6. Define a SURD. Investigate the formulæ $\frac{a^m}{a^n} = \frac{1}{a^{n-m}}$, or a^{m-n}; $a^{-p} = \frac{1}{a^p}$; $a^{\frac{1}{n}} \times b^{\frac{1}{n}} = (ab)^{\frac{1}{n}}$; $\left(a^{\frac{1}{m}}\right)^{\frac{1}{n}} = a^{\frac{1}{mn}}$.

If $a + \sqrt{b} = x + \sqrt{y}$, then $a = x$ and $\sqrt{b} = \sqrt{y}$.

EUCLID AND TRIGONOMETRY.

1. Define a point *negatively* and *positively*. State the divisions of a *problem* and a *theorem*. Distinguish between *direct* and *indirect* demonstration. What do you mean by one proposition being the *converse* of another? Enunciate those that are the *converse* of IV., V., XIII., XIX., of Book I.

2. Enunciate and prove the following propositions in Book I.: V., XXIX., XLVIII., and the corollaries of the XXXII.

3. Prove Book II.: VI., XIII., and apply Algebraic proof to the corollary of the 5th.—Book III.: XXXII.; Book IV.: X.

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1. Distinguish between *positive* and *negative* angles, and draw an angle in the *third quadrant*.

2. Define *Complement* and *Supplement*, and prove the formulæ $E = F - \frac{F}{10}$, and $F = E + \frac{E}{9}$. Prove that the sum of the n angles of any rectilineal figure $= (n - 2)\ 180$, and that the angle subtended by each side of a polygon is $\frac{360°}{n}$ or $\frac{180°}{n}$, according to its position.

3. Deduce the following formulæ: $\theta = \frac{A}{180}\pi$, $A = \frac{\theta}{\pi}180$, and give the result when $\theta = 1$. State when the formula $\theta = \frac{a}{r}$ may be used, and prove that the area of a circle whose radius is R, is πR^2.

4. State by letters and words *all* the Trigonometrical Ratios of an angle, naming the reciprocals, and prove the following:— $\tan = \frac{\sin}{\cos}$, $\cot = \frac{\cos}{\sin}$, $\sin^2 + \cos^2 = 1$, $\sec^2 = 1 + \tan^2$, $\operatorname{cosec}^2 = 1 + \cot^2$, and that if $\tan = \frac{a}{b}$, $\sin = \frac{a}{\sqrt{a^2 + b^2}}$ and $\cos = \frac{b}{\sqrt{a^2 + b^2}}$.

5. Deduce the formulæ for the sine, cosine, &c. of 30°, 45°, and 60°. Express the sine in terms of sec. and cotan. Given sec = 4, find sine and versed sine.

6. If m m' be the number of minutes in any angle, estimated in English and French systems respectively, shew that $\frac{m'}{m} = \frac{50}{27}$.

7. The angles of a right angled triangle are in $A\ P$: find them.

8. There are two polygons such that the difference of the sums of their interior angles is four right angles, and the ratio of the same as 5 : 3: find the number of sides in each. Express the interior angles in FRENCH measure.

MISCELLANEOUS QUESTIONS.

1. Prove the rule for *Subtraction* in Algebra. Assuming the truth of that for the multiplication of *powers*, deduce one for their *division*.

2. Find the *G. C. M.* of $2x^5 - 8x + 12x^3 - 8x^2 + 2x$, and $3x^5 - 6x^3 + 3x$, and the *L. C. M.* of $6x^2 - x - 1$ and $2x^2 + 3x - 2$.

Simplify $\dfrac{\dfrac{a}{b+c}}{\dfrac{d+e}{f}}$; $\dfrac{1}{1-x}$; according as $x = <$ or > 1.

3. Solve the following equations:—

(1). $\dfrac{1}{x-2} - \dfrac{1}{x-4} = \dfrac{1}{x-6} - \dfrac{1}{x-8}$.

(2). $(x+1)^2 = \{6 - (1-x)\}\, x - 2$.

(3). $x = 4y$, $\frac{1}{5}(2x + 7y) - 1 = \frac{3}{4}(2x - 6y + 1)$.

4. A and B play at bowls, and A bets B three shillings to two upon every game; after a certain number of games it appears that A has won three shillings, but had A bet 5s. to 2s., and lost one game more out of the same number, he would have lost thirty shillings. How many games did they play?

5. Find the product of

(1.) $a^{\frac{1}{2}}$, $a^{-\frac{1}{3}}$, $a^{-\frac{1}{4}}$, and $a^{-\frac{1}{5}}$.

(2). $\left(\dfrac{ay}{x}\right)^{\frac{1}{2}}$, $\left(\dfrac{bx}{y^2}\right)^{\frac{1}{3}}$, and $\left(\dfrac{y^2}{a^2b^2}\right)^{\frac{1}{4}}$.

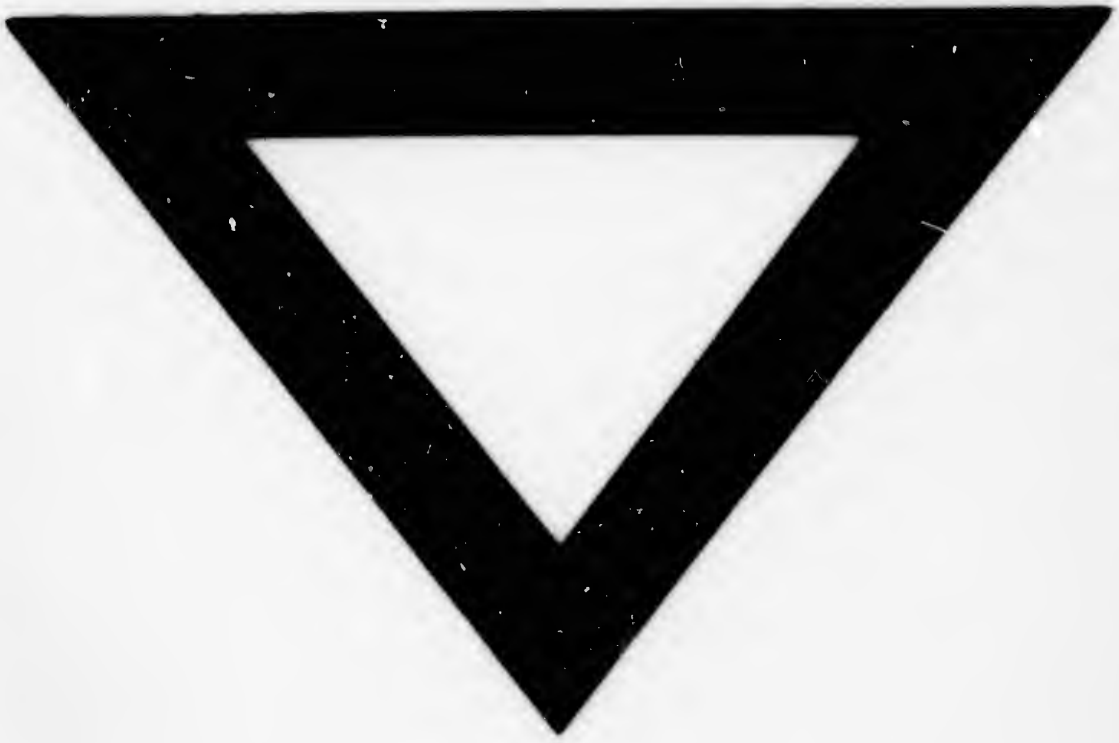
6. Add together ·0015 of 10s., 2·0615 of 10s. 6d., and 1·04 of 2s. 6d., and express the whole as the decimal of a pound.

7. If 264 men, in 5 days of 12 hours each, can dig a trench 240 yards long, 3 wide, and 2 deep, in how many days of 9 hours long will 24 men dig a trench 420 yards long, 5 wide, and 3 deep?

8. How many cord feet of wood in a load 7 feet long, 3 feet wide, and $3\frac{1}{3}$ feet high?

9. $L = 117$, $d = 8$, $n = 15$; find a. What annuity in 20 years, at 6 per cent., *simple* interest, will amount to \$1570?

10. What is the value of $1 + \frac{1}{4} + \frac{1}{16} +$ &c.?

11. If the contents of a triangle are 600 rods, and the base 75 rods, what is its altitude? How many square inches of leather will cover a ball $3\frac{1}{2}$ inches in diameter?

12. What is the difference between the perimeter of a square $19\frac{1}{4}$ miles on each side, and its inscribed circle?