

High School Number Sense Problem Sequencing Crosswalk

Problems 1 – 20

185 mastery skills from Number Dojo

- Addition, subtraction, multiplication, & division of Integers, Mixed Numbers, Fractions, and Decimals**
 - AddWhole, SubWhole, AddSubWhole, SubRev3Digit, *SubRev4Digit*, MultWhole, MultWhole3Num, DivWhole, DivDouble1st, DivMultiples, *AddF1/a+1/aa+*, AddFracSame, AddFracDiff, SubFracSame, SubFracDiff, Sub3F1/a-1/ab, MultFrac, DivFrac, DivFrac1000, AddDeci, *AddSubDeci*, SubDeci, MultDeci, DivWholeDeci, DivDeci, AddDeciFrac, EstAddWhole, EstAddSub, *EstSubWhole*, EstMultWhole, EstMultDeci, EstDivWhole, EstDivDeci, Div9, Div25, ReduceFrac, *MultFrac100*, *MultFracWhole*, RepDec.aaaa, PlaceValue, AddMixDiff, SubMixDiff, MultMixF+1, *DiffSquareMix*, *MultMixWhole*, MultMixSameF, DivMix, DivPowers2&5, EstMultFrac, AddFracRecip, Multa*b/b, MultFracWhol2, MultMixDiff, EstMult3Close, EstMult4Close
- Order of Operations**
 - OrderOfOper, OrderOfOper2, OrderOfOperF, EstOrderOfOp, ExpandNota, MultConsBy8, MultConsBy9
- Use of the Distributive Property**
 - MultDistribPr, MultDistrib2, MultDistrib3, EstMultDistr2
- Comparison of Fractions and Decimals**
 - CompareFrac, CompareDeciF
- Multiplication Short-Cuts**
 - Mult5, Mult11, Mult11var, Mult12, Mult12-19, Mult15, Mult25, Mult25var, Mult37, Mult50, *Mult50var*, Mult75, Mult75var, Mult101, Mult101var, Mult111, Mult111var, Mult125, Mult125var, Mult143, Mult90-99, Mult101-109, Mult990-999, Mult1001-1009, Mult1111etc, *Mult3367*, Mult10101, Mult10sU+10, MultUs10+10, MultEnd5, MultNear100+-, MultReverse, MultSquare, DiffSquares1, Double/Half, FOIL2by2Digit, FOIL3by3Digit
- Squaring Numbers**
 - Square11-20, Square21-30, Square31-40, Square41-50, Square51-60, *Square90-99*, SquareEnd5, Square2Digit, Square3Digit, Square990-999, EstSquare, AddNum+Square, DiffSquares2
- Conversion Problems (either way): Percent/Fractions, English/Metric, Roman Numerals/Arabic Numerals, Measurement units (length, weight, capacity, time)**
 - Conv%toDeci, Conv%toFrac, ConvDeci%, ConvDeciFrac, ConvFracDeci, ConvFrac%, Conv%FtoFrac, ConvMetric, ConvMetricOp, RomanToArabic, RomanOper, ConvAcreMile, ConvDistance, ConvDistArea, ConvDistVolu, ConvGalToInch, ConvTime, ConvVolume, ConvWeight, Div40, Div80, EstConvTime
- Greatest Common Divisor (GCD) and Least Common Multiple (LCM)**
 - FindGCF, FindLCM, MultGCFbyLCM
- Percent Problems**
 - Mult%, Mult%2, Mult%3, EstMult%, PercentAis_%, PercentAisB%, Percent<Than, Percent>Than
- Mean, Median, & Mode**
 - FindMeanAvg, FindMeanGeom, FindMedian, FindMode, FindRange
- Sums of Integers**
 - AddSequence, AddSeqOdd, AddSeqEven, AddSeqConsec

- Remainder problems**
 - RemainDiv5*, RemainDiv4, RemainDiv8, RemainDiv9, RemainDiv3, RemainDiv11, RemainDiv6
- Consumer type problems**
 - ConvCelsFahr, ConvFahrCels, *MoneyMarkup*, *MoneyDiscount*, MoneyInterest, MoneyTaxTip, MoneyCalc, MoneyRatio
- Number Theory Problems Involving: Prime Numbers, Divisors, Sums of Divisors, etc.**
 - Prime, PrimeFactor, PrimeRelative, NumPosIntDiv, AddPosIntDiv, OddEven, AbundantNum, Palindrome, PerfectNumber, UnitsDigit

Problems 21 – 40

75 mastery skills from Number Dojo

- Powers of Numbers**
 - AddSquareDoub, AddSquareTrip, *AddSquare7*, *AddSquareU+10*
- Substitution**
 - SubstDirect, SubstRatio
- Word problems**
 - ConvMileage, ConvSpeed, SolveXWord, FindLgNoProdX, FindLgNoSumX, Teamwork, *NumberSense*
- Inverses**
 - Reciprocal, Reciprocal2, FindInvAdd, AddRecipPID
- Absolute Value**
 - AbsoluteValue, SolveXAbso
- Ratio/proportion**
 - Ratio
- Square roots/cube roots**
 - SquareRoot, SquareRoot2, EstSquareRoot, SquareRootMem, SquareRootMix, SquareRootSim, CubesPowers, CubeRoot, *CubeRootMix*, EstCubeRoot, SolveXSqRoot
- Sets**
 - SetsElements*, SetsIntersect, SetsUnion, SetsUnion+Int, SetsSubsets, SetsProperImp, *SetsCartesian*
- Base System Conversion Problems**
 - BaseNtoBase10, Base10toBaseN, Base2toBase4, Base4toBase2, Base8toBase2, Base2toBase8, Base3toBase9, Base9toBase3, BaseAtoBaseB, EvilNumber, OdiousNumber
- Solving simple equations**
 - SolveX, SolveXDenom, SolveXExpo, SolveXRatio, SolveXSeq
- Systems of Equations**
 - SolveX2var
- Repeating Decimals to Fractions**
 - EstMult142857, RepDec.abab, RepDec.abbb, RepDec.abcabc, RepDec.abcbc, RepDec.abccc, RepDecFracDec
- More Remainder Type Problems**
 - RemainExpo, RemainExpress
- Perimeter & Area of Polygons and Circles**
 - Squares, Rectangle, Circles, Triangles, PolygonSides, Rhombus, Trapezoid
- Sequences**
 - SeqNextTerm, SeqNthTerm
- Quadratic & Cubic Equation Problems**
 - DiscrimRoot, FunctionExpo

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Problems 41 – 60

86 mastery skills from Number Dojo

- Laws of Exponents**
 - Exponent, ExponentFact, ExponentFrac, ExponentVar, ExponentVar2, MultPowers2&5, EstHighPower, AddSquareSpec, DivMultSquare, AddSquare+1, AddSquare+2, EstPhiPower, EstPiPower, EstMoneyInter
- Right Triangle Problems**
 - Pythagorean, TriangleCirc, TriangleRight
- Coordinate Geometry Problems**
 - Dist2Lines, Dist2Pts, DistPointLine, FindIntercept, GeomCartesian, Midpoint2Pts, SlopeLine2Pts, SlopeLineEqua, SlopeLinePerp
- Regular Polygon Problems**
 - AngleCentral, PolygonDiag, PolygonTriang, Polyhedron
- Inequalities**
 - Inequality
- Applications of Theorems from Geometry**
 - AngleArc, AngleClock, AngleCompSupp, AngleExterior, AngleInterior
- Direct and Inverse Variation**
 - Variation
- Sequences & Series (Finite & Infinite)**
 - Mult4Consec+1*, AddF1/n(n+1), AddSeqCube, AddSeqFibon, AddSeqGeom, AddSeqSquare, AddSubCube, AddSubSquare, DiffProdFibon, Pascal'sTriang, PiNotation, SigmaNotation
- Complex Numbers**
 - ComplexNumber, ImaginaryNum
- Logarithms & Logarithmic Equations**
 - EstEPower, Logarithm, LogNatural
- Factorials, Permutations, & Combinations**
 - FactorialOper, SolveXFacto, Permutation, Combination
- Probability/Odds**
 - ProbCoin, ProbDice, ProbDeckCards, ProbOther, Odds, OddsDice
- Conics**
 - CirclesEqua, Ellipse, Parabola
- Binomial Theorem (Expansion)**
 - ExpandCoeff, ExpandTerms, FactorPolynom
- Base System Problems Using Operations**
 - BaseAdd, BaseDiv, BaseMult, BaseSub, BaseFindBase, *BaseDiffSq2*
- Roots of equations**
 - AddMultRoots, AddRoots, FindMeanHarmo, MultRoots
- Polygonal numbers**
 - AddRecipTriang, AddSeqTriang, TriangularNum, PentagonalNum, HexagonalNum, OctagonalNum

Problems 61 – 70

31 mastery skills from Number Dojo

- Volume & Surface Area**
 - CubesSolid, Cone, Cylinder, Prism, Pyramid, Sphere
- Greatest Integer**
 - GreatestInteg
- Application of Remainder Theorem**
 - BaseRemain, RemainPolynom
- Trigonometry**
 - TrigFunction, TrigGraph, TrigIdentity, TrigSinCos, TrigValueArc, TrigValueDeg, TrigValueRad
- Determinants**
 - MatrixDeterm
- Matrices**
 - Matrix
- Vectors**
 - Vector
- Composite Functions**
 - FunctionCompo
- Bases Involving Decimals or Fractions**
 - Base10FtoNDec, BaseAtoBDeci, BaseNDeciFrac, BaseNDecTo10F, BaseNFracDeci, BaseNFto10Dec, BaseNto10Deci
- Polar/Rectangular Coordinates**
 - ConvDegRad, ConvRadDeg, AngleRefer, PolarCoord

Problems 71 – 80

12 mastery skills from Number Dojo

- Function domains and ranges**
 - FunctionDoma, FunctionRange
- Modular Arithmetic**
 - ModularMath
- Limits**
 - Limit
- Derivatives**
 - FunctionDeriv
- Slopes of Tangent Lines**
 - SlopeLineTang
- Horizontal & Vertical Asymptotes**
 - Asymptote
- Determining Critical Values**
 - CriticalValue
- Maximum & Minimum Problems**
 - FunctionMaxMn
- Definite Integration**
 - FunctionAntiD, Integral
- Inverse functions**
 - FunctionInver

(Adapted from https://www.uiltexas.org/files/academics/HS_NS_Sequence_Chart_revised_July20161.pdf)