Differentiated Math Reference Sheets & Task Cards

Secondary (Grades 6–10) | 200 Task Cards

Strand 1	Number Sense & Operations
Strand 2	Algebra
Strand 3	Geometry
Strand 4	Statistics & Data
Strand 5	Proportional Reasoning

Teacher Differentiation Guide

Strategies for Mixed-Ability Classrooms & IEP Support

This resource is designed to be highly adaptable, ensuring that students across a wide spectrum of abilities can access rigorous secondary mathematics. The Task Cards are explicitly tiered into three levels: **Foundation** (Green), **On-Level** (Blue), and **Challenge** (Red). Below are suggested grouping strategies and IEP accommodations.

Tiering System Explained

Tier	Color Code	Target Student	Description
Foundation	Green	Below Grade Level / IEP	Focuses on procedural fluency, single-step problems, and core vocabulary. Visual supports are maximized.
On-Level	Blue	At Grade Level	Multi-step problems, application of formulas, and moderate algebraic reasoning required.
Challenge	Red	Above Grade Level / Gifted	Complex multi-step reasoning, reverse-thinking problems, and advanced application scenarios.

Suggested Grouping Strategies

• **Station Rotation:** Set up 3 stations (Foundation, On-Level, Challenge). Assign students to a starting station based on pre-assessment data.

• **Think-Pair-Share (Mixed Ability):** Pair a Foundation student with an On-Level student. The Foundation student identifies the formula, while the On-Level student leads the calculation.

• **Choice Board:** Allow students to choose their tier. Require them to successfully complete 3 cards at one tier before 'leveling up'.

• **IEP Accommodations:** For Foundation tier users, provide formula reference sheets, extended time, and read-aloud accommodations.

Student Self-Tracking Progress Chart

Name: _____ Date: _____

Strand & Sub-Topic	Foundation	On-Level	Challenge	My Notes
Strand 1				
Sub-topic	■	■	■	
Sub-topic	■	■	■	
Sub-topic	■	■	■	
Sub-topic	■	■	■	
Strand 2				
Sub-topic	■	■	■	
Sub-topic	■	■	■	
Sub-topic	■	■	■	
Sub-topic	■	■	■	
Strand 3				
Sub-topic	■	■	■	
Sub-topic	■	■	■	
Sub-topic	■	■	■	
Sub-topic	■	■	■	
Strand 4				
Sub-topic	■	■	■	
Sub-topic	■	■	■	

Sub-topic	■	■	■	
Sub-topic	■	■	■	
Strand 5				
Sub-topic	■	■	■	
Sub-topic	■	■	■	
Sub-topic	■	■	■	
Sub-topic	■	■	■	

Strand 1 – Number Sense & Operations

Reference Sheet 1: Formulas & Vocabulary

Integers	• **Addition:** Same signs = Add absolute values, keep sign. Different signs = Subtract absolute values, keep sign of larger. • **Multiplication/Division:** Same signs = Positive. Different signs = Negative.
Fractions	• **Addition/Subtraction:** Requires a common denominator. • **Multiplication:** Multiply straight across ($^{a}/_{b} \times {}^{c}/_{d} = {}^{ac}/_{bd}$). • **Division:** Multiply by the reciprocal ($^{a}/_{b} \div {}^{c}/_{d} = {}^{a}/_{b} \times {}^{d}/_{c}$).
Decimals	• **Addition/Subtraction:** Line up decimal points vertically. • **Multiplication:** Multiply numbers, count total decimal places in factors, move decimal left in product. • **Division:** Move divisor decimal to make whole number; move dividend decimal same amount.
Percentages	• **Finding Part:** Part = Percent x Whole • **Finding Percent:** Percent = (Part / Whole) x 100 • **Finding Whole:** Whole = Part / Percent (as decimal)
Ratios	• Expressed as a:b or a/b. • **Equivalent Ratios:** Found by multiplying/dividing both terms by the same number. • **Proportion:** An equation showing two equivalent ratios (a/b = c/d).

Strand 1 – Number Sense & Operations

Reference Sheet 2: Worked Examples

Integers	**Evaluate: (-8) - (-12)** 1. Subtracting a negative is adding a positive: -8 + 12 2. Different signs: 12 - 8 = 4. Keep sign of larger: **4**
Fractions	**Subtract: $^{5}/_{6}$ - $^{1}/_{4}$** 1. Common denominator is 12. 2. Convert: $^{10}/_{12}$ - $^{3}/_{12}$ 3. Subtract numerators: $^{7}/_{12}$
Decimals	**Divide: 4.5 ÷ 0.15** 1. Move decimal 2 places right: 450 ÷ 15 2. Calculate: **30**
Percentages	**15% of 60 is what?** 1. Convert 15% to 0.15. 2. Multiply: 0.15 x 60 = **9**
Ratios	**Divide 100 in ratio 3:2** 1. Total parts = 3 + 2 = 5. 2. 1 part = 100 ÷ 5 = 20. 3. 3 parts = 60, 2 parts = 40. **Answer: 60 and 40**

Strand 1 – Vocabulary Reference Strips

Cut along the dotted lines to create individual vocabulary strips.

Integer	A whole number that can be positive, negative, or zero (e.g., -3, 0, 5).
Fraction	A part of a whole, expressed as num/den where num is the part and den is the whole.
Decimal	A number based on powers of 10, using a decimal point to separate whole units from fractional parts.
Percentage	A ratio or number expressed as a fraction of 100 (using the % symbol).
Ratio	A relationship between two quantities indicating how many times the first number contains the second.

Strand 1 – Task Cards

Strand 1 | Card 1 FOUNDATION

Evaluate: (-8) + 5

Strand 1 | Card 2 FOUNDATION

Evaluate: (-4) - (-6)

Strand 1 | Card 3 FOUNDATION

Evaluate: (-3) x (-7)

Strand 1 | Card 4 FOUNDATION

Evaluate: (-24) ÷ 6

Strand 1 | Card 5 FOUNDATION

Add: $^{1}/_{3} + {}^{1}/_{6}$

Strand 1 | Card 6 FOUNDATION

Subtract: $^{5}/_{8} - {}^{1}/_{4}$

Strand 1 | Card 7 FOUNDATION

Multiply: $^{2}/_{5} \times {}^{3}/_{4}$

Strand 1 | Card 8 FOUNDATION

Divide: $^{3}/_{4} \div {}^{1}/_{2}$

Strand 2 – Answer Key & Worked Solutions

1. 6x	*Combine like terms: (4+2)x = 6x*
2. 3y	*Combine like terms: (5-2)y = 3y*
3. 3x + 12	*Distribute the 3: 3(x) + 3(4) = 3x + 12*
4. x = 8	*Subtract 7 from both sides: x = 15 - 7 = 8*

5. y = 13	*Add 3 to both sides: y = 10 + 3 = 13*
6. x = 7	*Divide both sides by 2: x = 14 ÷ 2 = 7*
7. x = 20	*Multiply both sides by 4: x = 5 x 4 = 20*
8. x = 4	*Subtract 1: 2x = 8. Divide by 2: x = 4*

9. y = 5	*Add 6: 3y = 15. Divide by 3: y = 5*
10. 6	*Substitute x=3: f(3) = 2(3) = 6*
11. 9	*Substitute x=4: f(4) = 4 + 5 = 9*
12. 3	*In slope-intercept form (y = mx + b), m is the slope. Here, m = 3*

13. 2	*In y = mx + b, b is the y-intercept. Here, b = 2*
14. x > 5	*Greater than means >, so x > 5*
15. 11x - 4	*Distribute: 8x - 4 + 3x. Combine like terms: 11x - 4*
16. 4y - 8	*Distribute: 6y - 2y - 8. Combine like terms: 4y - 8*

17. x = 7	*Add 7: 3x = 21. Divide by 3: x = 7*
18. x = -3	*Subtract 5: -2x = 6. Divide by -2: x = -3*
19. x = 18	*Add 4: x/3 = 6. Multiply by 3: x = 18*
20. y = -3	*Subtract 4: -2y = 6. Divide by -2: y = -3*

21. x < -4	*Divide by -3, flip inequality sign: x < -4. Open circle at -4, arrow left.*
22. x <= 3	*Subtract 1: 2x <= 6. Divide by 2: x <= 3. Closed circle at 3, arrow left.*

Strand 5 | Card 29 CHALLENGE

y varies inversely with the square of x. y = 4 when x = 3. Find y when x = 6.

Strand 5 | Card 30 CHALLENGE

Pipe A fills a tank in 3 hours. Pipe B fills it in 5 hours. How long to fill the tank together?

Strand 5 | Card 31 CHALLENGE

If x is doubled, what happens to y in the equation $y = k/x^2$?

Strand 5 | Card 32 CHALLENGE

A scale model has a volume of 5 cubic inches. If the scale factor is 1:4, what is the volume of the actual object?

Strand 5 | Card 33 CHALLENGE

Convert 30 ft/s to miles per hour. (1 mi = 5280 ft, 1 hr = 3600 s)

Strand 5 | Card 34 CHALLENGE

z varies jointly with x and y. z = 24 when x = 3 and y = 4. Find z when x = 2 and y = 6.

Strand 5 | Card 35 CHALLENGE

The scale on a map is 2 cm : 50 km. Two towns are 7 cm apart on the map. What is the actual distance?

Strand 5 | Card 36 CHALLENGE

A cyclist rides at 15 km/h. How long will it take to ride 40 km?

Strand 5 – Answer Key & Worked Solutions

1. 60 mph	*Unit rate = 120 miles ÷ 2 hours = 60 miles per hour*
2. x = 6	*Cross-multiply: 3 x 10 = 5 x x -> 30 = 5x -> x = 6*
3. 36 inches	*3 ft x 12 in/ft = 36 inches*
4. 25 miles	*2.5 inches x 10 miles/inch = 25 miles*

5. k = 3	*y = kx -> 6 = k(2) -> k = 3*
6. They are equal	*Unit rate 1: $2.00/10 = $0.20/oz. Unit rate 2: $3.00/15 = $0.20/oz*
7. $20	*Unit rate = $12 ÷ 3 = $4/book. 5 books = 5 x $4 = $20*
8. 300 seconds	*5 min x 60 sec/min = 300 seconds*

9. 6	*Corresponding side = 3 x 2 = 6*
10. 20 words/min	*80 words ÷ 4 minutes = 20 words per minute*
11. x = 6	*Cross-multiply: 2x = 12 -> x = 6*
12. 2500 g	*2.5 kg x 1000 g/kg = 2500 g*

13. Yes	*Direct variation is y = kx. When x=0, y=0, so it always passes through the origin.*
14. 55 miles per hour	*A unit rate compares a quantity to exactly 1 unit of another quantity (1 hour).*
15. 3 cups	*Proportion: $^{2}/_{8} = {}^{x}/_{12}$ -> 8x = 24 -> x = 3*
16. 1000 m/min	*60 km/hr = 60,000 m / 60 min = 1000 m/min*

17. 35	*k = 15/3 = 5. Equation: y = 5x. When x = 7: y = 5(7) = 35*
18. 2	*xy = k -> k = 12. When x = 6: 6y = 12 -> y = 2*
19. 1.5 km	*Actual = 3 x 50,000 = 150,000 cm. Convert to km: 150,000 ÷ 100,000 = 1.5 km*
20. 36 oz for $7.20	*Unit rate 1: $6/24 = $0.25/oz. Unit rate 2: $7.20/36 = $0.20/oz. Second is cheaper.*

21. 9 in	*Scale factor = 6 / 2 = 3. New length = 3 x 3 = 9 in*

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