GRADE 8 MATHS

Integers, Rational Numbers & Operations

Complete Printable Worksheet Pack

6 Worksheets	**Number-Line Reasoning**
Rational Number Operations	**Algebra & Real-Life Problems**

Printable practice and answer keys for independent learning, classroom use and revision.

Worksheet 1: Integers & Number-Line Reasoning

Name: _____ Date: _____

1. Arrange in ascending order: –7, 4, –2, 0, 9, –11.

2. Find the distance between –8 and 5 on a number line.

3. Evaluate: –14 + 9 – 6.

4. Evaluate: 18 – (–7) – 12.

5. Which is greater: –3.5 or –3.8? Explain.

6. A temperature is –6°C in the morning and rises by 11°C. What is the new temperature?

7. Find the missing integer: x – 15 = –4.

8. Find the value of –3(7 – 10).

9. A submarine is 125 m below sea level and rises 48 m. What is its new position relative to sea level?

10. Explain why multiplying two negative numbers gives a positive result using a pattern.

Answer Key — Worksheet 1

1. –11, –7, –2, 0, 4, 9.

2. 13 units.

3. –11.

4. 13.

5. –3.5, because it is closer to zero.

6. 5°C.

7. x = 11.

8. 9.

9. –77 m.

10. Example pattern: (–3)×3 = –9, (–3)×2 = –6, (–3)×1 = –3, (–3)×0 = 0. Continuing the pattern gives (–3)×(–1) = 3.

Worksheet 2: Rational Numbers — Comparing & Ordering

Name: _____ Date: _____

1. Convert 0.625 to a fraction in simplest form.

2. Convert 7/8 to a decimal.

3. Arrange from least to greatest: –1/2, 0.4, –0.75, 2/3.

4. Compare –5/6 and –0.8 using <, > or =.

5. Find a rational number between 3/5 and 2/3.

6. Which is greater: 7/9 or 0.77? Show reasoning.

7. Arrange: –1.25, –5/4, –1.2, –6/5.

8. Give three different rational numbers between –2 and –1.

9. A number x satisfies –3/4 < x < –1/2. Give one fraction that satisfies this.

10. Explain why rational numbers are dense on the number line.

Answer Key — Worksheet 2

1. 5/8.

2. 0.875.

3. –0.75, –1/2, 0.4, 2/3.

4. –5/6 < –0.8, because –5/6 = –0.8333… and –0.8333… is less than –0.8.

5. Example: 19/30 ≈ 0.6333.

6. 7/9 ≈ 0.777…, so 7/9 > 0.77.

7. –1.25 = –5/4 < –1.2 = –6/5.

8. Examples: –7/4, –3/2, –5/4.

9. Example: –2/3.

10. Between any two different rational numbers, another rational number can be found; for example, their average.

Worksheet 3: Operations with Rational Numbers

Name: _____ Date: _____

1. Calculate: 3/4 + 5/6.

2. Calculate: 7/8 – 1/3.

3. Calculate: (–2/5) × (15/4).

4. Calculate: (–7/9) ÷ (14/15).

5. Evaluate: 2/3 – 5/6 + 1/2.

6. Evaluate: (–3/4)(8/9) + 1/3.

7. A recipe uses 2 1/2 cups of flour. You make 3/4 of the recipe. How much flour is needed?

8. A debt of $84 is reduced by 3/7. How much debt remains?

9. Find x: x/5 = –3/4.

10. Simplify: 5/6 ÷ (–10/9).

Answer Key — Worksheet 3

1. 19/12 = 1 7/12.

2. 13/24.

3. –3/2 = –1 1/2.

4. –5/6.

5. 1/3.

6. –1/3.

7. 15/8 = 1 7/8 cups.

8. Reduced by $36, so $48 remains.

9. x = –15/4 = –3 3/4.

10. –3/4.

Worksheet 4: Properties, Expressions & Rational Values

Name: _____ Date: _____

1. Identify the property: $7(3+5)=7\times3+7\times5$.

2. Simplify: $-4x + 7x - 3$.

3. Simplify: $5(2x-3)-4x$.

4. Evaluate $3a-2b$ when $a=-4$ and $b=5$.

5. Simplify: $(2/3)x + (1/6)x$.

6. If $x=-3/4$, find $8x+5$.

7. Solve: $2x+5=-11$.

8. Solve: $3(x-2)=15$.

9. A number is multiplied by -4 and then 7 is added to give 19. Find the number.

10. Explain why the distributive property is useful when working with negative numbers.

Answer Key — Worksheet 4

1. Distributive property.

2. $3x - 3$.

3. $5(2x-3)-4x = 10x-15-4x = 6x-15$.

4. $3(-4)-2(5) = -22$.

5. $(2/3)x + (1/6)x = (4/6)x + (1/6)x = (5/6)x$.

6. -1.

7. $x = -8$.

8. $x = 7$.

9. $-4x+7=19$, so $-4x=12$ and $x=-3$.

10. It lets us distribute a factor across a sum or difference without changing the value; for example, $-3(5-2)=-15+6$.

Worksheet 5: Rational Numbers in Real Life

Name: _____ Date: _____

1. A bank account is –$45.50. A deposit of $72.25 is made. What is the new balance?

2. A recipe requires 1 3/4 cups of milk. You have only 2/3 of that amount. How much milk do you have?

3. A hiker descends 2.4 km and then climbs 1.75 km. What is the net change in elevation?

4. A temperature changes from –3.5°C to 4.2°C. By how many degrees did it rise?

5. A shop has a loss of $18.75 on Monday and a profit of $27.50 on Tuesday. What is the net result?

6. A tank is 5/6 full. Then 1/4 of the tank's capacity is used. What fraction remains?

7. A student spends 3/8 of a $64 gift card. How much remains?

8. A road is 12.5 km long. A cyclist completes 3/5 of it. How far remains?

9. A debt of $240 is paid off in 8 equal monthly payments. What rational number represents the change in the debt each month?

10. A machine's temperature falls 2.75°C each hour for 6 hours. What is the total change?

Answer Key — Worksheet 5

1. $26.75.

2. 1 1/6 cups.

3. –0.65 km.

4. 7.7°C.

5. $8.75 profit.

6. 5/6–1/4 = 10/12–3/12 = 7/12.

7. Spent $24; $40 remains.

8. Completed 7.5 km; 5 km remains.

9. –$30 per month.

10. –16.5°C.

Worksheet 6: Integers & Rational Numbers Challenge

Name: _____ Date: _____

1. Find x: (–3/5)x = 9/10.

2. Simplify: 1/2 – [3/4 – (–2/3)].

3. A number is increased by 25% and the result is –30. What was the original number?

4. Find two rational numbers whose product is –6 and whose sum is 1.

5. A sequence begins –2, 4, –8, 16, ... Find the next three terms and describe the rule.

6. The average of three rational numbers is –2. Their first two values are 1/2 and –5. Find the third.

7. A rectangular field has length 7 1/2 m and width 4 2/3 m. Find its exact area.

8. Without using a calculator, decide whether (–7/8)÷(14/15) is positive or negative and estimate its size.

9. Find the value of x if |x–3|=5. Give both solutions.

10. A student claims: “Adding a positive rational number always makes a number larger.” Is this always true if the starting number is negative? Explain with an example.

Answer Key — Worksheet 6

1. $x = -3/2$.

2. $1/2 - [3/4 - (-2/3)] = 1/2 - (3/4+2/3) = 6/12-17/12 = -11/12$.

3. $1.25x = -30$, so $x = -24$.

4. 3 and -2: product -6, sum 1.

5. -32, 64, -128; multiply by -2 each time.

6. Total must be -6. The first two sum to $1/2-5 = -9/2$, so the third is $-6-(-9/2) = -3/2$.

7. $(15/2)(14/3) = 35$ m².

8. Negative; the exact value is $-5/6$, so its magnitude is about 0.83.

9. $x = 8$ or $x = -2$.

10. Yes. Adding a positive rational number always increases the value, even if the starting number is negative. For example, $-10+3 = -7$, and -7 is greater than -10.