

Four Operations Revision Worksheet - Worked Solutions

Whole Numbers, Decimals, and Negative Numbers

Section 1: Addition and Subtraction

1. $45 + 376 =$

Solution:

$$\begin{aligned} 45 + 376 &= 45 + 300 + 76 \\ &= 345 + 76 \\ &= 345 + 50 + 26 \\ &= 395 + 26 \\ &= 421 \end{aligned}$$

Alternatively: Line up vertically:

$$\begin{array}{r} 45 \\ + 376 \\ \hline 421 \end{array}$$

2. $328.5 + 19.47 =$

Solution: Line up decimal points:

$$\begin{array}{r} 328.50 \quad (\text{add trailing zero for clarity}) \\ + 19.47 \\ \hline 347.97 \end{array}$$

$$328.5 + 19.47 = 347.97$$

3. $7.63 + (-2.8) =$

Solution: Adding a negative is the same as subtraction:

$$\begin{aligned} 7.63 + (-2.8) &= 7.63 - 2.8 \\ &= 7.63 - 2.80 \quad (\text{line up decimals}) \\ &= 4.83 \end{aligned}$$

4. $-12 + 7 =$

Solution: Think of a number line: start at -12, move 7 to the right:

$$-12 + 7 = -5$$

Alternatively: $12 - 7 = 5$, but since -12 has larger magnitude, answer is negative: -5.

5. $56.3 - 18.72 =$

Solution: Line up decimals, borrow as needed:

$$\begin{array}{r} 56.30 \quad (\text{add trailing zero}) \\ - 18.72 \\ \hline 37.58 \end{array}$$

$$56.3 - 18.72 = 37.58$$

6. $-4 - (-9) =$

Solution: Subtracting a negative is the same as adding:

$$\begin{aligned} -4 - (-9) &= -4 + 9 \\ &= 5 \end{aligned}$$

Section 2: Multiplication

- | | | |
|-------------------------------|--------------------------|-------------------------------------|
| 1. $24 \times 6 =$ | 5. $3.4 \times 1.2 =$ | 9. $-3 \times 4 =$ |
| 2. $-2 \times -3 \times -2 =$ | 6. $5.6 \times (-0.3) =$ | 10. $0.0034 \times 68.7 =$ |
| 3. $0.25 \times 0.4 =$ | 7. $12.5 \times 0.08 =$ | 11. $-4.2 \times 0.5 \times -0.5 =$ |
| 4. $1.2 \times 0.06 =$ | 8. $0.09 \times 0.7 =$ | 12. $-0.6 \times -0.3 \times -2 =$ |

Solutions:

1. $24 \times 6 = 144$

Working: $20 \times 6 = 120$, $4 \times 6 = 24$, total $120 + 24 = 144$.

2. $-2 \times -3 \times -2 = -12$

Working: Count negatives: three negatives (odd number) gives negative answer.

$$(-2 \times -3) \times -2 = (6) \times -2 = -12$$

3. $0.25 \times 0.4 = 0.1$

Working: Method 1 - Counting decimal places:

$$25 \times 4 = 100$$

2 decimal places in 0.25 + 1 decimal place in 0.4 = 3 decimal places total. So answer is $0.100 = 0.1$.

4. $1.2 \times 0.06 = 0.072$

Working: $12 \times 6 = 72$, 1 decimal place + 2 decimal places = 3 decimal places: 0.072.

5. $3.4 \times 1.2 = 4.08$ (as shown in example)

6. $5.6 \times (-0.3) = -1.68$

Working: $56 \times 3 = 168$, 1 decimal place + 1 decimal place = 2 decimal places: 1.68. One negative: answer is negative: -1.68 .

7. $12.5 \times 0.08 = 1.0$

Working: $125 \times 8 = 1000$, 1 decimal place + 2 decimal places = 3 decimal places: 1.000 = 1.0.

8. $0.09 \times 0.7 = 0.063$

Working: $9 \times 7 = 63$, 2 decimal places + 1 decimal place = 3 decimal places: 0.063.

9. $-3 \times 4 = -12$

Working: One negative: answer negative. $3 \times 4 = 12$, so -12 .

10. $0.0034 \times 68.7 = 0.23358$

Working: $34 \times 687 = 23358$ (calculate: $34 \times 600 = 20400$, $34 \times 87 = 2958$, total 23358). 4 decimal places + 1 decimal place = 5 decimal places: 0.23358.

11. $-4.2 \times 0.5 \times -0.5 = 1.05$

Working: Two negatives: answer positive. First: $4.2 \times 0.5 = 2.1$ ($42 \times 5 = 210$, $1+1=2$ decimal places: 2.10). Then: $2.1 \times 0.5 = 1.05$ ($21 \times 5 = 105$, $1+1=2$ decimal places: 1.05).

12. $-0.6 \times -0.3 \times -2 = -0.36$

Working: Three negatives: answer negative. First: $0.6 \times 0.3 = 0.18$ ($6 \times 3 = 18$, $1+1=2$ decimal places). Then: $0.18 \times 2 = 0.36$. With negative sign: -0.36 .

Section 3: Division

1. $84 \div 7 = 12$

Working: $7 \times 12 = 84$, or bus stop:

$$\begin{array}{r} 7 \overline{)84} \quad 7 \text{ into } 8 = 1 \text{ remainder } 1 \\ \text{Bring down } 4, 7 \text{ into } 14 = 2 \\ \text{Answer: } 12 \end{array}$$

2. $156 \div 12 = 13$

Working: Chunking: $156 \div 4 = 39$, then $39 \div 3 = 13$. Or: $12 \times 13 = 156$.

3. $48 \div (-6) = -8$

Working: One negative: answer negative. $48 \div 6 = 8$, so -8 .

4. $4.8 \div 0.4 = 12$

Working: Multiply both by 10: $48 \div 4 = 12$.

5. $-9 \div -3 = 3$

Working: Two negatives: answer positive. $9 \div 3 = 3$.

6. $8280 \div 24 = 345$

Working: Bus stop method:

$$\begin{array}{r} 24 \overline{)8280} \quad 24 \text{ into } 82 = 3 \quad (24 \times 3 = 72) \\ 82 - 72 = 10, \text{ bring down } 8 = 108 \\ 24 \text{ into } 108 = 4 \quad (24 \times 4 = 96) \\ 108 - 96 = 12, \text{ bring down } 0 = 120 \\ 24 \text{ into } 120 = 5 \quad (24 \times 5 = 120) \\ \text{Answer: } 345 \end{array}$$

7. $3.6 \div 0.6 = 6$

Working: Multiply both by 10: $36 \div 6 = 6$.

8. $0.84 \div 0.07 = 12$

Working: Multiply both by 100: $84 \div 7 = 12$.

9. $7.2 \div 0.6 = 12$

Working: Multiply both by 10: $72 \div 6 = 12$.

10. $-12.6 \div 0.3 = -42$

Working: One negative: answer negative. Multiply both by 10: $126 \div 3 = 42$, so -42 .

11. $0.56 \div 0.08 = 7$

Working: Multiply both by 100: $56 \div 8 = 7$.

12. $6.4 \div (-0.2) = -32$

Working: One negative: answer negative. Multiply both by 10: $64 \div 2 = 32$, so -32 .

13. $-1.8 \div 0.3 = -6$

Working: One negative: answer negative. Multiply both by 10: $18 \div 3 = 6$, so -6 .

14. $-0.45 \div 0.05 = -9$

Working: One negative: answer negative. Multiply both by 100: $45 \div 5 = 9$, so -9 .

Section 4: Mixed Practice

1. $12.5 + (-3.4) = 9.1$

Working: $12.5 - 3.4 = 9.1$.

2. $-3 \times 4 \times -2 = 24$

Working: Two negatives: answer positive. $3 \times 4 = 12$, $12 \times 2 = 24$.

3. $24 \div (-6) + 5 \times 2 = 6$

Working: BODMAS: division and multiplication first. $24 \div (-6) = -4$, $5 \times 2 = 10$. Then: $-4 + 10 = 6$.

4. $6.3 \div 0.3 = 21$

Working: Multiply both by 10: $63 \div 3 = 21$.

5. $(-2.4 \times 3.5) \div -0.7 = 12$

Working: First: $-2.4 \times 3.5 = -8.4$ (one negative). Then: $-8.4 \div -0.7 = 12$ (two negatives: positive). Check: $8.4 \div 0.7 = 84 \div 7 = 12$.

6. $-15 + 28.4 \div 4 = -8.9$

Working: Division first: $28.4 \div 4 = 7.1$. Then: $-15 + 7.1 = -7.9$.

7. $7.25 - 3.68 = 3.57$

Working: Line up decimals:

$$\begin{array}{r} 7.25 \\ - 3.68 \\ \hline 3.57 \end{array}$$

8. $-8 \times (5 - 7) = 16$

Working: Brackets first: $5 - 7 = -2$. Then: $-8 \times -2 = 16$ (two negatives: positive).

9. $9.6 \div 1.2 + (-3) \times 2 = 2$

Working: Division and multiplication first: $9.6 \div 1.2 = 8$ (multiply both by 10: $96 \div 12 = 8$). $(-3) \times 2 = -6$. Then: $8 + (-6) = 8 - 6 = 2$.

10. $-36 \div (-9) = 4$

Working: Two negatives: positive. $36 \div 9 = 4$.

Extension Word Problems

1. The temperature was -3°C and dropped by 5°C overnight. What is the new temperature?

Solution: Dropping means subtracting:

$$-3 - 5 = -8$$

New temperature: -8°C .

2. A scuba diver descends 2.5 m per minute for 4 minutes, then ascends 3 m. What is the diver's final depth?

Solution: Descend: $2.5 \times 4 = 10$ m down (negative if surface is 0). Ascend: 3 m up (positive). Starting at surface (0 m):

$$0 - 10 + 3 = -7$$

Final depth: 7 m below surface.

3. A submarine starts at sea level and travels vertically -4.2 km, then another -3.8 km. How far is it from the surface now? What is the submarine's altitude?

Solution: Both movements are downward (negative):

$$0 + (-4.2) + (-3.8) = -8.0$$

Distance from surface: 8.0 km (absolute value). Altitude: -8.0 km (8 km below sea level).

4. Some numbers produce recurring decimals when used as divisors. Find the decimal result of 1 divided by each of the first 7 prime numbers. Some results terminate while others recur. Can you explain why?

Solution: First 7 primes: 2, 3, 5, 7, 11, 13, 17.

$$1 \div 2 = 0.5 \quad (\text{terminates})$$

$$1 \div 3 = 0.\overline{3} \quad (\text{repeats})$$

$$1 \div 5 = 0.2 \quad (\text{terminates})$$

$$1 \div 7 = 0.\overline{142857} \quad (\text{repeats})$$

$$1 \div 11 = 0.\overline{09} \quad (\text{repeats})$$

$$1 \div 13 = 0.\overline{076923} \quad (\text{repeats})$$

$$1 \div 17 = 0.\overline{0588235294117647} \quad (\text{repeats})$$