Aksum Math

Algebra 2

Algebra · Grade 7

★ Hard · 15 Questions

Name: _____

Date: _____

Score: _____ / 15

Solve each problem. Show your work in the space provided. Write your answer on the line.

1. Solve: $3(2x - 4) - 2(x + 1) = 10$

Answer: _____

2. Solve: $(3x + 1)/4 = (x - 2)/2 + 3$

Answer: _____

3. Solve for x: ax + b = c (express in terms of a, b, c)

Answer: _____

4. Solve: |2x − 5| = 9

Answer: _____

5. The width of a rectangle is 3 less than half its length. The perimeter is 54 cm. Find both dimensions.

Answer: _____

6. Solve: $2(x + 3)/5 = (x - 1)/2$

Answer: _____

7. Three consecutive odd integers sum to 81. Find them.

Answer: _____

8. Solve: $3x - 2(4 - x) = 5x - 8$

Answer: _____

9. A jar has nickels and dimes totalling $2.75. There are 35 coins. How many of each?

Answer: _____

10. Solve: $5 - (3x + 2) = 2(x - 4) + 1$

Answer: _____

11. Two numbers differ by 14. Twice the smaller plus three times the larger equals 102. Find both.

Answer: _____

12. Solve: $(x + 3)/4 + (2x - 1)/3 = 5$

Answer: _____

13. Solve the system: $2x + y = 10$ and $x - y = 2$

Answer: _____

14. A tank holds 480 L. It's filled by two pipes: Pipe A fills 40 L/min, Pipe B fills 20 L/min. A drain removes 10 L/min. All three run simultaneously. How long to fill the tank?

Answer: _____

15. Solve: $3|x + 2| - 5 = 7$

Answer: _____

Answer Key

Algebra 2 — Hard

1. **x = 6**

6x−12−2x−2=10. 4x−14=10. 4x=24. x=6. Check: 3(8)−2(7)=24−14=10. ✓

2. **x = 7**

Multiply by 4: 3x+1=2(x−2)+12. 3x+1=2x+8. x=7. Check: (22)/4=5.5; (5)/2+3=5.5. ✓

3. **x = (c − b) / a**

ax=c−b. Divide by a: x=(c−b)/a, provided a≠0.

4. **x = 7 or x = −2**

2x−5=9 → x=7. 2x−5=−9 → 2x=−4 → x=−2.

5. **Length = 20 cm; Width = 7 cm**

w=L/2−3. 2(L+w)=54 → L+w=27. L+L/2−3=27. 3L/2=30. L=20. w=7.

6. **x = 17**

Cross-multiply: 4(x+3)=5(x−1). 4x+12=5x−5. 17=x.

7. **25, 27, 29**

n+(n+2)+(n+4)=81. 3n+6=81. 3n=75. n=25.

8. **All real numbers (identity)**

3x−8+2x=5x−8. 5x−8=5x−8. Always true → infinite solutions.

9. **20 dimes, 15 nickels**

d+n=35 and 10d+5n=275. Sub n=35−d: 10d+5(35−d)=275. 5d+175=275. 5d=100. d=20, n=15. Check: 10(20)+5(15)=200+75=275. ✓

10. **x = 2**

5−3x−2=2x−8+1. 3−3x=2x−7. 10=5x. x=2.

11. **Smaller=12, Larger=26**

L=S+14. 2S+3(S+14)=102. 5S+42=102. 5S=60. S=12. L=26. Check: 2(12)+3(26)=24+78=102. ✓

12. **x = 5**

Multiply by 12: 3(x+3)+4(2x−1)=60. 3x+9+8x−4=60. 11x+5=60. 11x=55. x=5. Check: (8)/4+(9)/3=2+3=5. ✓

13. **x = 4, y = 2**

Add: 3x=12. x=4. Then y=10−8=2.

14. **9.6 minutes**

Net rate = 40+20−10=50 L/min. Time = 480÷50=9.6 min.

15. **x = 2 or x = −6**

3|x+2|=12. |x+2|=4. x+2=4 → x=2. x+2=−4 → x=−6.