Aksum Math

Name: _____

Slope & y = mx + b

Date: _____

Algebra · Grade 8

Score: _____ / 12

◆ Medium · 12 Questions

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

1. Find the equation of a line with slope 2 passing through (3, 7).

Answer: _____

2. Find the equation of the line through (0, −4) and (3, 2).

Answer: _____

3. Are the lines $y = 3x + 2$ and $y = 3x - 5$ parallel, perpendicular, or neither?

Answer: _____

4. Are the lines $y = 2x + 1$ and $y = -\frac{1}{2}x + 3$ parallel, perpendicular, or neither?

Answer: _____

5. A line passes through $(-2, 1)$ and $(4, 4)$. Find the equation in slope-intercept form.

Answer: _____

6. Find the x-intercept and y-intercept of the line $3x - 4y = 12$.

Answer: _____

7. Write $2x + 3y = 9$ in slope-intercept form.

Answer: _____

8. A linear function has $f(0) = 5$ and $f(3) = 14$. Find the slope and equation.

Answer: _____

9. A line has x-intercept 4 and y-intercept −6. Find its equation.

Answer: _____

10. Do the lines $2x - y = 4$ and $6x - 3y = 12$ represent the same line?

Answer: _____

11. A car rental costs $30 base plus $0.20 per km. Write the cost equation and find cost for 150 km.

Answer: _____

12. Find the equation of a line perpendicular to $y=4x-1$ passing through $(8, 3)$.

Answer: _____

Answer Key

Slope & y = mx + b — Medium

1. **y = 2x + 1**

y−7=2(x−3). y=2x−6+7=2x+1.

2. **y = 2x − 4**

slope=(2−(−4))/(3−0)=6/3=2. y-int=−4. y=2x−4.

3. **Parallel**

Same slope (m=3), different y-intercepts → parallel.

4. **Perpendicular**

Slopes 2 and −½: product = 2×(−½) = −1 → perpendicular.

5. **y = ½x + 2**

slope=(4−1)/(4−(−2))=3/6=½. y−4=½(x−4). y=½x−2+4=½x+2.

6. **x-intercept = 4; y-intercept = −3**

x-int: set y=0: 3x=12, x=4. y-int: set x=0: −4y=12, y=−3.

7. **y = −⅔x + 3**

3y=−2x+9. y=(−2/3)x+3.

8. **slope = 3; y = 3x + 5**

slope=(14−5)/(3−0)=9/3=3. y-int=5. y=3x+5.

9. **y = 1.5x − 6**

Points (4,0) and (0,−6). slope=(0−(−6))/(4−0)=6/4=3/2. y=(3/2)x−6.

10. **Yes (same line)**

Multiply the first by 3: 6x−3y=12. Identical to the second equation.

11. **C = 0.20d + 30; C = $60**

C=0.20(150)+30=30+30=$60.

12. **y = −¼x + 5**

Perpendicular slope = −1/4. y−3=−¼(x−8). y=−¼x+2+3=−¼x+5.