

Algebra 1
Chapter 5 Review

Forms of Linear Equations

Slope-intercept form: $y = mx + b$

Point-slope form: $y - y_1 = m(x - x_1)$

Standard form: $Ax + By = C$

} You need to know these for the test!

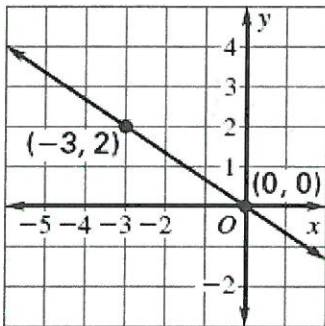
1. Write an equation in slope-intercept form of the line with a slope of -3 and a y -intercept of 17 .

$$y = -3x + 17$$

2. Write an equation in point-slope form of the line with a slope of 2 that passes through the point $(12, -1)$.

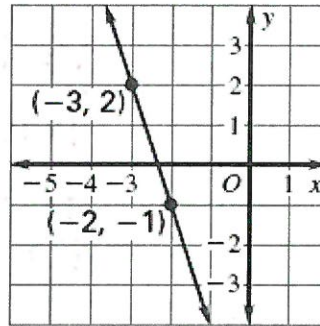
$$y + 1 = 2(x - 12)$$

3. Write an equation in slope-intercept form of the line shown below.



$$y = \frac{-2}{3}x + 0$$

4. Write an equation in point-slope form of the line shown below.



$$y - 2 = -3(x + 3) \text{ or } y + 1 = -3(x + 2)$$

5. Your science class is taking a field trip to an observatory. The cost of a presentation and a tour of the telescope is \$60 for the group plus an additional \$3 per person. Write an equation that gives the total cost C as a function of the number of people p in the group. Then find the total cost for a class of 19 people, including the teacher.

$$C = 3p + 60$$

$$C = 3(19) + 60$$

$$C = 57 + 60$$

$$C = \$117$$

6. A gym membership costs \$100 for 2 months and \$205 for 5 months. Write an equation for the total cost of gym membership. What is the initial membership fee? What is the cost per month? How much does it cost to join the gym for 1 year?

$$m = \frac{205 - 100}{5 - 2} = \frac{105}{3}$$

$$m = \$35/\text{month}$$

$$100 = 2(35) + b$$

$$100 = 70 + b$$

$$30 = b$$

$$C = 35(12) + 30$$

$$C = \$450 \text{ for 1 year}$$

Initial Membership fee \$30

Cost per month: \$35/month

7. Write an equation in point-slope form of the line that passes through (4, 5) and (2, 9).

$$m = \frac{5-9}{4-2} = \frac{-4}{2} = -2$$

$$y-5 = -2(x-4)$$

or

$$y-9 = -2(x-2)$$

8. Write an equation in slope-intercept form of the line that passes through (3, 4) and (1, -6).

$$m = \frac{4-(-6)}{3-1} = \frac{10}{2} = 5$$

$$4 = 5(3) + b$$

$$4 = 15 + b$$

$$-11 = b$$

$$y = 5x - 11$$

9. Write an equation of the line that passes through the point (2, 0) and is parallel to the line $y = -5x + 3$.

$$0 = -5(2) + b$$

$$0 = -10 + b$$

$$10 = b$$

$$y = -5x + 10$$

10. Write an equation of the line that passes through the point (-1, 4) and is perpendicular to the line $x + y = -4$.

$$y = -x - 4$$

$$y = 1x + b$$

$$4 = 1(-1) + b$$

$$4 = -1 + b$$

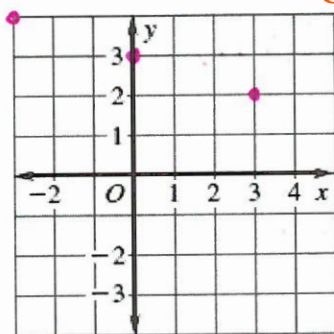
$$5 = b$$

$$y = x + 5$$

opposite
reciprocal of
-1 is 1.

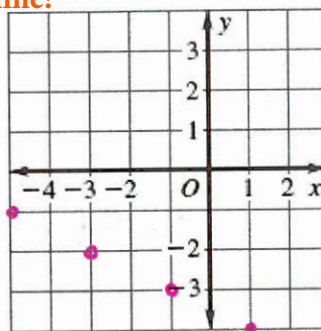
Graph each equation.

11. $x + 3y = 9$ $y = -\frac{1}{3}x + 3$



Connect the points with a line!

12. $y + 2 = \frac{-1}{2}(x + 3)$



$$(-3, -2)$$

$$m = -\frac{1}{2}$$

13. A piggy bank contains only nickels and quarters. The total value in the bank is \$3.80. Write an equation in standard form that models the possible combinations of nickels and quarters in the piggy bank.

x : number
of nickels

y : number of
quarters

$$100(0.05x + 0.25y = 3.80)$$

$$5x + 25y = 380$$

The table below shows the gas mileages (in miles per gallon) for cars of different weights (in thousands of pounds).

Weight	2	2.4	2.5	2.8	2.9	3.1	3.2	3.5	3.6	3.9
Mileage	34	34	28	23	25	23	23	22	24	18

14. Make a scatter plot of the data. (No work needed)

15. Describe the correlation. **Negative Correlation**
 As the weight of a vehicle increases,
 the gas mileage tends to decrease.

17. Write an equation of the line of best fit. (round to the nearest hundredth)

$$y = -7.82x + 48.77$$

18. Predict the gas mileage for a car the weights 3400 pounds.

3.4 thousand pounds

$$y = -7.82(3.4) + 48.77$$

$$y = 22.182 \text{ miles/gallon}$$

19. Find the zero of the function and explain what it means in this situation.

$$0 = -7.82x + 48.77$$

$$\frac{-48.77}{-7.82} = \frac{-7.82x}{-7.82} \quad x \approx 6.24$$

20. Find the zero of the function $f(x) = \frac{5}{2}x - 6$.

$$0 = \frac{5}{2}x - 6$$

$$6 = \frac{5}{2}x$$

$$12 = 5x$$

$$\frac{12}{5} = x$$

$$2.4 = x$$

