

CYCLE #3 Equations of Lines

Show all work. No Calculator

1. Write an equation of the (a) vertical line and (b) horizontal line passing through the point $(-7, \pi)$.
2. Write an equation of the line in **general form** passing through the points $(-3, 4)$ and $(5, -1)$.
Remember to exclude and fractions in your final answer.
3. Write an equation of the line through the point $\left(4, \frac{1}{2}\right)$ that is (a) parallel to and

(b) perpendicular to the line $4x - 3y = 6$. Then (c) both the x - and y - intercepts of the line found in part (b).
4. Find the value of x for which line through $(-8, -3)$ and $(x, 4)$ has a slope of 3.

5. Ms. Herro leaves school in her truck via Delta Highway at time $t = 0$ traveling at 45 mph.

(a) Write an expression $d(t)$ for the distance Ms. Herro travels from school

(b) Graph $y = d(t)$

(c) What is the slope of the graph in part (b)? What does it have to do with the truck?

(d) Create a scenario in which t could have negative values.

(e) Create a scenario in which the y -intercept of $y = d(t)$ could be 15.

(f) Create a scenario where Piney would not be in JRo's truck (those of you who are unfamiliar with Piney will simply need to leave this blank).

6. The tangent line to the graph of $f(x) = 4x^2$ at $x = -1$ has an equation $y = -8x - 4$.
- (a) Find the coordinate $(x, f(x))$ of the point of tangency.
- (b) Find the equation of the normal line at this point.
- (c) Find the other coordinate where the normal line intersects the function f .
- (d) The tangent line of f at $x = -1$ is used to approximate $f(-2)$. Find this approximation.
- (e) Is your approximation from part (d) an over or and under approximation of the true value of $f(-2)$? Justify.

Multiple Choice

_____ 7. Which of the following is an equation of the line through $(-3, 4)$ with a slope of $\frac{1}{2}$?

- (A) $y - 4 = \frac{1}{2}(x + 3)$ (B) $y + 3 = \frac{1}{2}(x - 4)$ (C) $y - 4 = -2(x + 3)$
D) $y - 4 = 2(x + 3)$ (E) $y + 3 = 2(x - 4)$

_____ 8. Which of the following is an equation of the vertical line through $(2, -4)$?

- (A) $y = -4$ (B) $x = -2$ (C) $y = 4$ (D) $x = 0$ (E) $x = 2$

_____ 9. Which of the following is the x -intercept of the line $y = 2x - 5$?

- (A) $x = -5$ (B) $x = 5$ (C) $x = 0$ (D) $x = \frac{5}{2}$ (E) $x = -\frac{5}{2}$

_____ 10. Which of the following is an equation of the line through $(-2, -1)$ parallel to the line $y = -3x + 1$?

- (A) $y = -3x + 5$ (B) $y = -3x - 7$ (C) $y = \frac{1}{3}x - \frac{1}{3}$ (D) $y = -3x + 1$ (E) $y = -3x - 4$

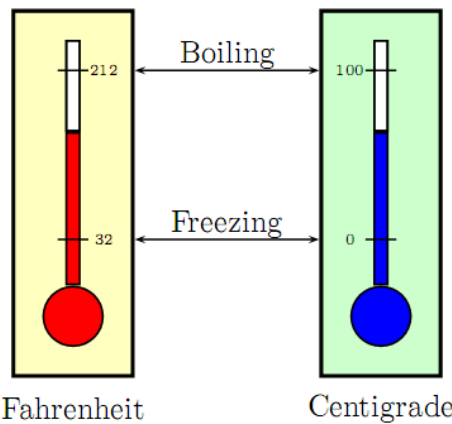
_____ 11. Find the x -intercept of the straight line passing through the point $(4, 5)$ and parallel to $y + 3x = 1$.

- (A) $\frac{17}{4}$ (B) 6 (C) $\frac{17}{3}$ (D) $-\frac{7}{3}$ (E) $-\frac{17}{3}$

_____ 12. Find the y -intercept of the straight line passing through the point $(5, 3)$ and perpendicular to $y + 2x = 1$.

- (A) $-\frac{1}{2}$ (B) $\frac{11}{2}$ (C) $\frac{1}{2}$ (D) 0 (E) $-\frac{11}{2}$

_____ 13. There is a linear relationship $T_F = mT_C + b$ between the temperature T_F on the Fahrenheit scale and its equivalent T_C on the Centigrade scale. As the thermometers show, water freezes at $32^\circ F$ and boils at $212^\circ F$, whereas it freezes at $0^\circ C$ and boils at $100^\circ C$. Convert $-5^\circ C$ to its Fahrenheit equivalent.



- (A) $\approx 23^\circ F$ (B) $\approx 24^\circ F$ (C) $\approx 20^\circ F$ (D) $\approx 22^\circ F$ (E) $\approx 21^\circ F$