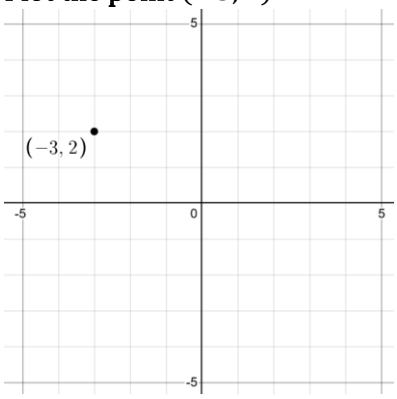
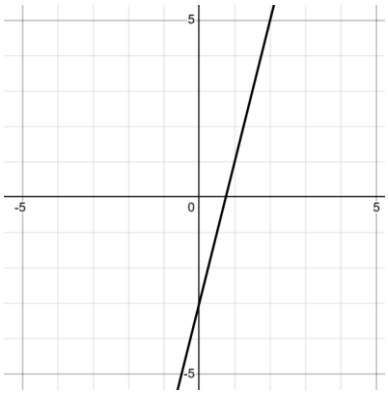
# Math 9 Linear Relations Assignment Solutions

1. **Plot the point $(-3, 2)$**



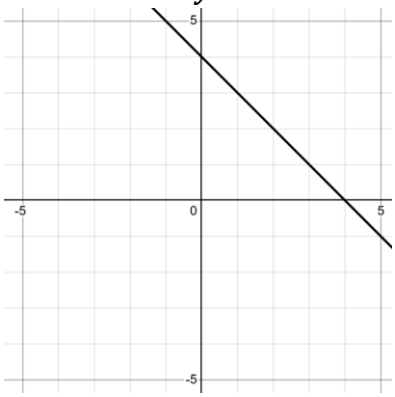

2. **$y = 4x - 3$**
   a. **Sketch this line**



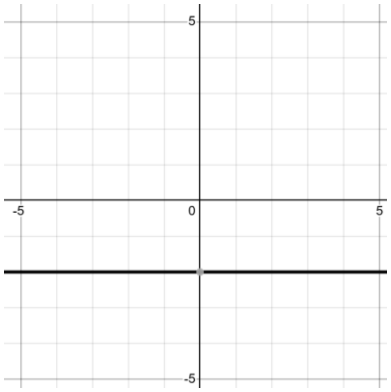

   b. **Slope?**
   **4**

   c. **$y$-intercept?**
   **$-3$**

3. **Sketch the line $y = -x + 4$**

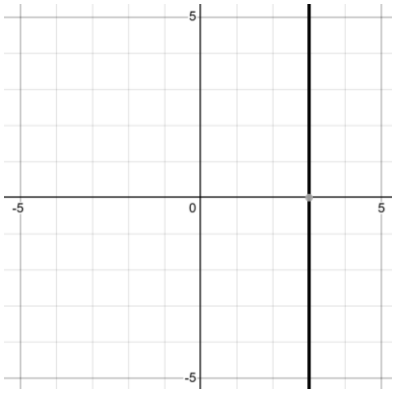


4. $y = -2$
   a. Sketch this line



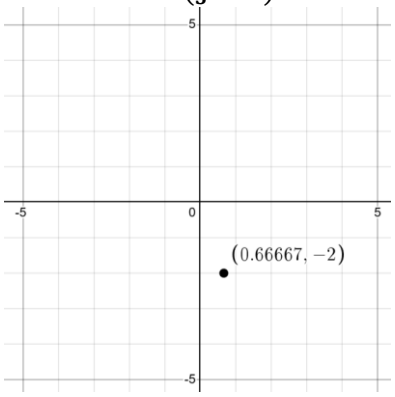

   b. What quadrants is this line in?
   Quadrants III and IV

5. $x = 3$
   a. Sketch the line

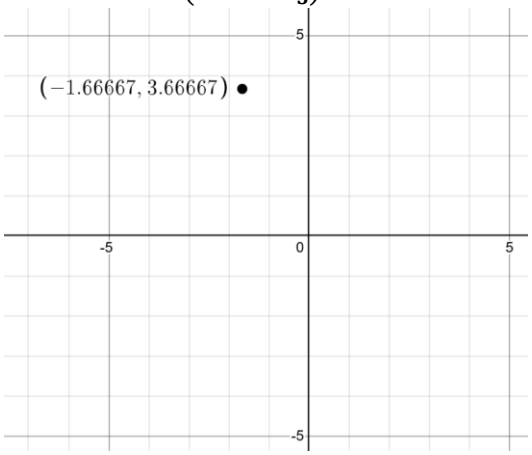



   b. What quadrants is this line in?
   Quadrants I and IV

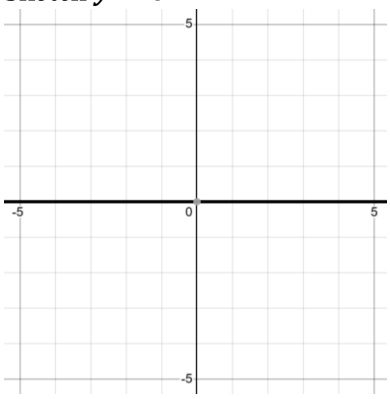
6. Plot the point $\left(\frac{2}{3}, -2\right)$



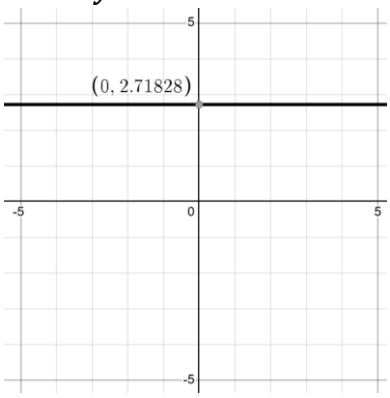
7. **Plot the point** $\left(-1.\overline{6}, 3\frac{2}{3}\right)$




8. **Sketch** $y = 0$




9. **Sketch** $y = e$

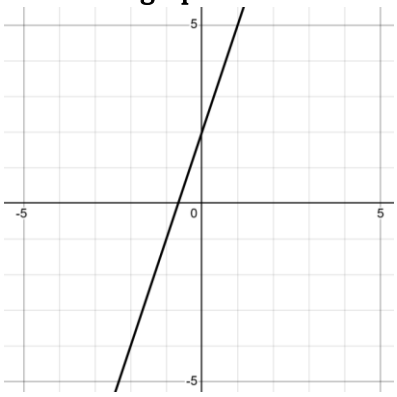


10. $y = 3x + 2$

a. Create a table of values

| $x$ | $3x + 2$ |
|---|---|
| $-2$ | $-4$ |
| $-1$ | $-1$ |
| 0 | 2 |
| 1 | 5 |
| 2 | 8 |
| 3 | 11 |
| 4 | 14 |

b. Sketch the graph




c. State the $x$-intercept

$0 = 3x + 2$

$-2 = 3x$

$x = -\frac{2}{3}$ or $\left(-\frac{2}{3}, 0\right)$

d. When $x = -3$, what is the value of $y$?

$y = 3x + 2 = 3(-3) + 2 = -7$

11. Given $y = px + q$ what is the meaning of:

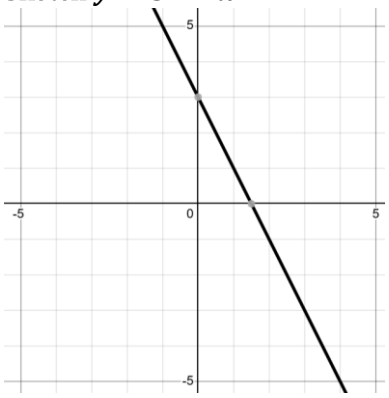
a. $p$?

Slope

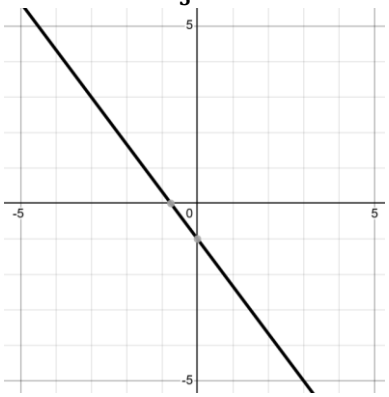
b. $q$?

$y$-intercept or $q$-intercept

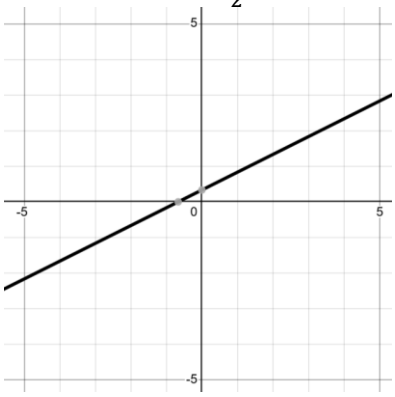
12. Sketch $y = 3 - 2x$




13. Sketch: $y = \frac{4}{-3}x - 1$

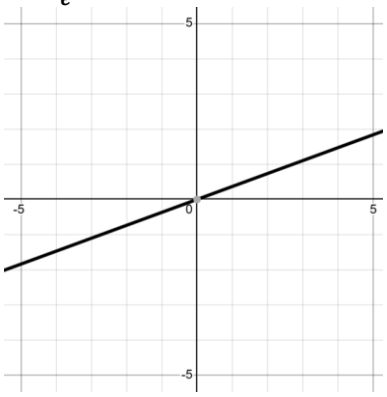



14. Sketch $y = 0.\overline{3} + \frac{x}{2}$




15. Sketch $x = ey$

$y = \frac{1}{e}x$



16. Given the points $(1, -3)$ and $(5, -4)$

a. Find the slope

$m = \frac{-4+3}{5-1} = -\frac{1}{4}$

b. Find the line equation in slope-point form: $y - y_1 = m(x - x_1)$

$y + 3 = -\frac{1}{4}(x - 1)$ or $y + 4 = -\frac{1}{4}(x - 5)$

c. Find the line equation in slope-intercept form: $y = mx + b$

$y = -\frac{1}{4}x + \frac{1}{4} - \frac{12}{4} = -\frac{1}{4}x - \frac{11}{4}$

17. Given the point $\left(3\frac{2}{3}, -\frac{1}{4}\right)$ and $\left(-4, 2\frac{2}{3}\right)$ find the slope.

Same as $\left(\frac{11}{3}, -\frac{1}{4}\right)$ and $\left(-4, \frac{8}{3}\right)$

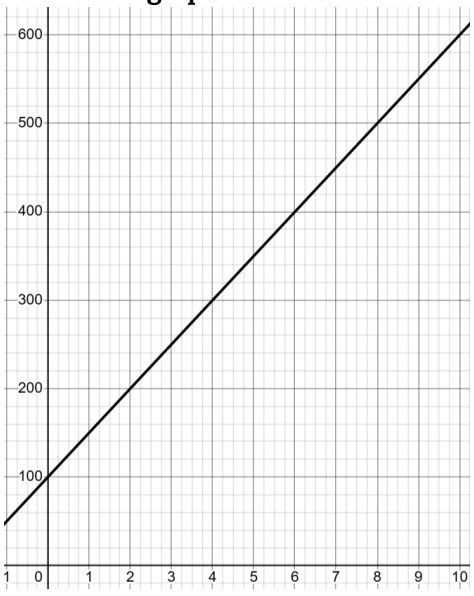
$m = \frac{\frac{8}{3}+\frac{1}{4}}{-4-\frac{11}{3}} = \frac{35}{12} \div -\frac{23}{3} = \frac{35}{12} \times -\frac{3}{23} = -\frac{35}{92}$

18. You charge \$100 for a diagnostic fee and then charge \$50 per hour of labour

a. What is the equation of the graph?

$y = 50x + 100$

b. Sketch this graph




c. How much do you make for working 6 hours?

$y = 50(6) + 100 = \$400$

d. How long do you have to work to earn \$325?

$325 = 50x + 100$

$225 = 50x$

$x = \frac{225}{50} = \frac{9}{2} = 4.5$ hours

19. 20, 15, 10, … Find the $1000^{th}$ number

$\boldsymbol{y = -5x + 25}$

$\boldsymbol{y = -5(1000) + 25 = -5000 + 25 = -4975}$