

Chapter 3 Review (Linear Functions)

1. Find the slope of the line through (6, -7) and (4, -8).

$$m = \frac{-8 - (-7)}{4 - 6} = \frac{-1}{-2} = \boxed{\frac{1}{2}}$$

1. $\frac{1}{2}$

2. Find the slope of the line through (0, 5) and (5, 5).

$$m = \frac{5 - 5}{5 - 0} = \frac{0}{5} = \boxed{0}$$

2. 0

3. It is expected that 563 quadrillion thermal units of Btu (British thermal units) of energy will be consumed worldwide in 2015. In 2003, worldwide consumption was 421 quadrillion Btu. What is the expected rate of change in consumption from 2003 to 2015?

$$\frac{563 - 421}{2015 - 2003} = \frac{142}{12} = \boxed{11.8\bar{3}}$$

3. $11.8\bar{3}$ quadrillion BTU per year

4. A sewing circle creates the same number of quilts every year to sell at the state fair. This year they created 3 more quilts than normal. This can be represented by
- $y = x + 3$
- , where
- x
- is the number of quilts created in previous years and
- y
- is the total number of quilts created this year. What is the standard form of this linear equation?

$$y = x + 3$$

$$-x + y = 3 \Rightarrow \boxed{x - y = -3}$$

4. $x - y = -3$

5. Find the value of
- r
- so the line that passes through (-5, 2) and (3,
- r
-) has a slope of
- $-\frac{1}{2}$
- .

$$-\frac{1}{2} = \frac{r - 2}{3 - (-5)}$$

$$-\frac{1}{2} = \frac{r - 2}{8}$$

$$-8 = 2(r - 2)$$

$$-8 = 2r - 4$$

$$-4 = 2r \Rightarrow r = -2$$

5. -2

6. Determine whether
- $y = 2x - 3$
- is a linear equation. If so, write the equation in standard form.

$$-2x + y = -3$$

$$\boxed{2x - y = 3}$$

6. Yes ($2x - y = 3$)

7. Graph
- $3y - x = 6$
- by using the
- x
- and
- y
- intercepts.

$$3(0) - x = 6$$

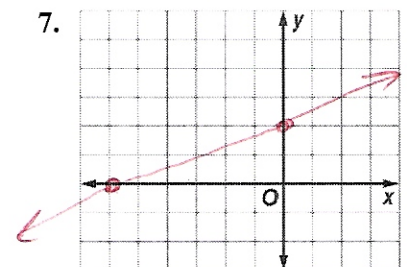
$$-x = 6$$

$$x = -6$$

$$3y - 0 = 6$$

$$3y = 6$$

$$y = 2$$



Determine whether each equation is a linear equation. Write *yes* or *no*.

8. $2x = 4y$ *yes*

9. $6 + y = 8$ *yes*

10. $4x - 2y = -1$ *yes*

11. $3xy + 8 = 4y$
no

12. $3x - 4 = 12$
yes

13. $y = x^2 + 7$
no

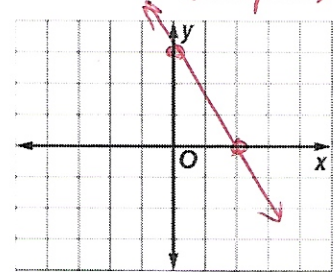
14. Find the x- and y-intercepts of $3x + 2y = 6$. Then, graph the equation.

$$\begin{aligned} 3(0) + 2y &= 6 \\ 2y &= 6 \\ y &= 3 \end{aligned}$$

$$\begin{aligned} 3x + 2(0) &= 6 \\ 3x &= 6 \\ x &= 2 \end{aligned}$$

X-intercept: $(2, 0)$

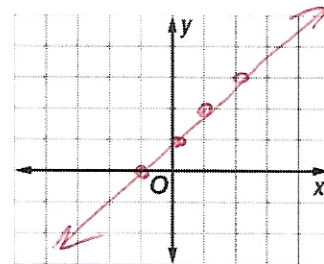
Y-intercept: $(0, 3)$



15. Graph the following equation by making a table: $x - y = -1$

x	y
-1	0
0	1
1	2
2	3

$$y = x + 1$$



16. Find the value of r so that the line through $(10, r)$ and $(3, 4)$ has a slope of $-\frac{2}{7}$.

$$\begin{aligned} -\frac{2}{7} &= \frac{4-r}{3-10} \\ -\frac{2}{7} &= \frac{4-r}{-7} \\ 14 &= 7(4-r) \\ 14 &= 28 - 7r \\ -14 &= -7r \\ 2 &= r \end{aligned}$$

17. Find the rate of change for 1950-1975. Explain the meaning.

$$\frac{0.93 - 0.55}{1975 - 1950} = \frac{0.38}{25} = 0.0152$$

0.0152 billion people per year

