1. Slope intercept form: $y=m x+b$

Point-Slope Form: $y-y_{1}=m\left(x-x_{1}\right)$
2. Write an equation of the line in Slope-Intercept Form with a slope of $-\frac{2}{5}$ and point $(0,6)$.

$$
y=-\frac{2}{5} x+6
$$

3. Write the equation of the line in slope intercept form that passes through $(1,-4)^{x}$ with a slope of -5 .

$$
\begin{array}{rlr}
m=-5 & y & =m x+b \\
-4 & =-5(1)+b & y=-5 x+1 \\
b=1 & -4 & =-5+b \\
1 & =b
\end{array}
$$

4. Write the equation of the line in slope intercept form that passes through the points $(2,-10)$ and (4, -4)

$$
\begin{aligned}
m=\frac{3}{4-2} \\
b=\frac{-16}{4}
\end{aligned} \quad \begin{aligned}
m=\frac{-4+10}{2}=3 & =m x+b \\
-4 & =3(4)+b \\
-4 & =12+b \\
-16 & =b
\end{aligned} \quad y=3 x-1 b
$$

5. Write an equation of the line that has an $x$-intercept of 8 and a $y$-intercept of -12 in slope intercept form.
$m=\frac{3 / 2}{}$
$b=-12$
$m=\frac{0+12}{8 \div 0}=\frac{12}{8}=\frac{3}{2}$
$(0,-12)$
$(8,0)$

6. Write an equation in Point-Slope Form of the line that that passes through the point $(4,7)$ and has a slope of $\frac{3}{2}$.

$$
y-7=\frac{3}{2}(x-4)
$$

7. Write an equation in Point-Slope Form of the line that passes through the points: $(-1,4)$ and $(2,8)$

$$
m=\frac{8-4}{2+1}=\frac{4}{3}
$$

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

$$
y-8=\frac{4}{3}(x-2)
$$

8. Write an equation of the line that passes through the point $(8,-3)$ and has a slope of $\frac{3}{2}$.
a. Write first in Point Slope:

$$
\begin{aligned}
y+3 & =\frac{3}{2}(x-8) \\
y+3 & =\frac{3}{2} x-12 \\
y & =\frac{3}{2} x-15
\end{aligned}
$$

9. Write an equation of the line that passes through the points: $(-12,5)$ and $(-6,2)$
a. Write first in Point Slope: $m=\frac{5-2}{-12+6}=\frac{3}{-6}=\frac{-1}{2}$

$$
\begin{aligned}
& y-2=-\frac{1}{2}(x+6) \\
& y-2=-\frac{1}{2} x-3
\end{aligned}
$$

b. Now rearrange into slope-Intercept:

$$
y=-\frac{1}{2} x-1
$$

10. Write an equation for the linear function $f$ with the given values. $\mathrm{f}(-1)=7, \mathrm{f}(3)=3$

$$
(-1,7) \quad(3,3)
$$

a. Write first in Point Slope:

$$
m=\frac{7-3}{-1-3}=\frac{4}{-4}=-1
$$

$$
y-3=-1(x-3)
$$

b. Now rearrange into slope-Intercept:

$$
\begin{aligned}
y-3 & =-1 x+3 \\
y & =-x+6
\end{aligned}
$$

11. Determine which form - slope-intercept or point-slope - would be the better (more efficient) method of writing an equation of a line based on the information provided. You do NOT have to write the line.
a. $m=2$, point @ $(-2,0)$

b. Two points @ $(3,5)$ and $(0,6)$
$\uparrow$
$y$-int
pt-slope!
slope-int
c. Two points @ $(-4,7)$ and $(-1,2)$

12. Write an equation of the line shown.
a.


Slope-Intercept:

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

b.


$$
m=\frac{3}{1}
$$

$$
p t:(-2,-3)
$$

Point-Slope:
$\tau_{\text {your equation }}$ might look different:
TRICKY ONE!
13. You and your besties decide to take a cross-country road trip to see Taylor Swift perform at the Staples Center. 2.5 hours into your drive, you notice your odometer reads 20,000 miles. 10 hours later,
your odometer reads 20,750 miles.
$(2.5,20.000)$

$$
(12.5,20,750)
$$

$2.5+10=12.5 \mathrm{hrs}$
miles $=\frac{\Delta y}{\Delta x}$
$\frac{\Delta y}{\Delta x} \quad(2.5,20,000)$

$$
2.5+10=12.5 \mathrm{hrs}
$$

into the drive
$h r$ a. Write an equation - in the form that makes most sense - to model the mileage as a function of the time spent in the car.

$$
m=\frac{20750-20000}{12.5-2.5}=75 \quad y-20.000=75(x-2.5) \text { OR } y-20.750=75(x-12.5)
$$

b. What does the slope mean in the context of this problem?

$$
\text { you travel } 75 \text { miles/hom }
$$

c. How many miles had your car logged before you and your friend embarked on this road trip?

$$
\begin{array}{ll}
19,812.50 \text { miles } \quad y-1 \text { nt ! } & y-20000=75 x-187.5 \\
y=75 x+19,812.50
\end{array}
$$

d. Up for a Challenge! How long will it take you to reach the Staples Center if its 1,740 miles from your home in Chicago?

$$
\uparrow
$$

$$
\begin{aligned}
& 21552.5=75 x+19812.50 \\
& 1740=75 x \\
& 23.2 \text { hows }
\end{aligned}
$$

$$
+19812.50=21552.5
$$

$$
\stackrel{O R}{=} \frac{1740 \text { (distance) }}{75 \text { (speed) }}=\underset{\text { (time) }}{23.2 \text { hour }}
$$

