CAT Day 4 Writing Equations of Lines
WW

$\qquad$
$\qquad$
Find the slope of the line through the pair of points.
$\begin{array}{ll}x_{1} y_{1} & x_{2} \\ y_{2}\end{array}$

1. $(-2,1)$ and $(5,-3)$
2. $(7,-4)$ and $(7,-2)$

$$
m=\frac{-3-1}{5++2}=\frac{-4}{7}
$$

3. $(3,-1)$ and $(-5,-1)$

$$
x_{1} y_{1} \quad x_{2} y_{2}
$$

$$
m=\frac{-1++1}{-5-3}=\frac{0}{-8}
$$



Find the value of $x$ or $y$ so that the line through the pair of points has the given slope.
4. $\left.\begin{array}{cc}x_{1} & y_{1} \\ (-3,-5)\end{array}\right)$ and $(4, y)$ when $m=3$
$\begin{array}{cc}x_{1} y_{1} & x_{2} y_{2} \\ \text { 5. } & (-8,-2)\end{array}$ and $(x, 2)$ when $m=\frac{1}{2}$

$$
\begin{array}{r}
\frac{y+5}{4++3} \rightarrow \frac{y+5}{7}=\frac{3}{1} \\
y+5=21 \\
y=16
\end{array}
$$

$$
\begin{array}{r}
\frac{2++2}{x++8} \rightarrow \frac{4}{x+8}=\frac{1}{2} \\
x+8=8 \\
x=0
\end{array}
$$

Write the slope-intercept form equation for the line.
6. $7 x-12 y=96$

$$
\begin{gathered}
\frac{-12 y}{-12}=-\frac{7 x}{-12}+\frac{96}{-12} \\
y=\frac{7}{12} x-8
\end{gathered}
$$

8. Passes through $\begin{gathered}x_{1} y_{1}\end{gathered} \quad x_{2} y_{2}$
9. Passes through $(-4,5)$ and $(4,3)$

$$
\begin{aligned}
m=\frac{3-5}{4++4} & =\frac{-2}{8}=-\frac{1}{4} \\
y-5 & =-\frac{1}{4}(x+4) \\
y-5 & =-\frac{1}{4} x-1 \\
+5 & +5 \\
y & =-\frac{1}{4} x+4
\end{aligned}
$$

7. Passes through the point $(-4,3)$ with a slope of $\frac{-2}{3}$

$$
\begin{aligned}
& y-3=\frac{-2}{3}(x+4) \\
& y-3=-\frac{2}{3} x-\frac{8}{3} \quad y=\frac{-2}{3} x+\frac{1}{3}
\end{aligned}
$$

9. Passes through $\left.\begin{array}{c}x_{1}, y_{1} \\ (4,-7)\end{array}\right)$ and $\begin{aligned} & x_{2} y_{2} \\ & (6,-7)\end{aligned}$

$$
m=\frac{-7++7}{6-4}=\frac{0}{2}=0
$$

Write the standard form equation for the line.
10. Passes through the point $(-2,3)$ with a slope of $\frac{1}{4}$

$$
4(y-3)=\frac{14}{4}(x+2)
$$

$$
\begin{aligned}
4 y-12 & =x+2 \\
-x+12 & -x+12 \\
-x+4 y & =14 \rightarrow \quad x-4 y=-14
\end{aligned}
$$

$$
\begin{array}{ll}
x_{1} y_{1} & x_{2} y_{2}
\end{array}
$$

11. Passes through $(-4,1)$ and $(1,11)$

$$
m=\frac{11-1}{1++4}=\frac{10}{5}=2
$$

$$
\begin{aligned}
& y-1=2(x+4) \\
& -2 x y-1=2 x+8 \\
& +1=-2 x+1 \\
& -2 x+y=9 \rightarrow 2 x-y=-9
\end{aligned}
$$

Name the $x$ - and $y$-intercepts.
12. $y=-8 x-48$
13. $2 x-y=35$

$$
\begin{aligned}
x \text {-int. }: \quad 0 & =-8 x-48 \\
48 & =-8 x \quad x=-6 \quad(-6,0) \\
y \text {-int: }: & y=-8(0)-48 \quad(0,-48)
\end{aligned}
$$

$$
\begin{aligned}
& 2 x-y=35 \\
& x-\text { int } \therefore 2 x-0=35
\end{aligned}
$$

$$
2 x=35
$$

$$
\begin{aligned}
& y \text {-int.: } \\
& 2(0)-y
\end{aligned}
$$

$$
x=0=\frac{35}{2}
$$

14. Write the equation of the line in standard form that passes through

$$
\begin{aligned}
& y \text {-int: } \\
& 2(0)-y=35 \quad\left(\frac{35}{2}, 0\right) \\
& y=-35 \\
& (0,-35)
\end{aligned}
$$ $(2,-5)$ and is parallel to the line $y=-2 x+4$

$$
y=35 \quad y=-35 \quad(0,-35)
$$

$$
2 x+y=-1
$$

15. Write the equation of the line in slope-intercept form that passes through $(-6,2)$ and is perpendicular to the line $3 x-5 y=15$

$$
m_{\perp}=-\frac{5}{3}
$$

$$
\begin{array}{ll}
\frac{-5 y}{-5}=\frac{-3 x}{-5}+\frac{15}{-5} & y=\frac{3}{5} x-3 \\
x+6 & y=-\frac{5}{3} x-8
\end{array}
$$

$$
y-2=-\frac{5}{3}(x+6) \quad y=-\frac{5}{3} x-8
$$

$$
\begin{gathered}
y-x=-\frac{5}{3} x-10 \\
+2
\end{gathered}
$$

$$
\begin{aligned}
& m=-2 \\
& \begin{array}{r}
y+5=-2(x-2) \\
y+8=-2 x+4 \\
+2 x+\frac{5}{-2}+2 x-5
\end{array}
\end{aligned}
$$

