(18) Find the slope and y-intercept of $2x - y = 7 + 5x$.

\[
\begin{align*}
2x - y &= 7 + 5x \\
- y &= 7 + 3x \\
- y &= 3x + 7 \\
\boxed{y &= -3x - 7}
\end{align*}
\]

Slope is $-3$, y-intercept is $-7$.

(19) Find the equation of the line passing through $(1,4)$ with slope of $3$.

\[
y = 4, \quad x = 1, \quad y = mx + b, \quad m = 3
\]

\[
\begin{align*}
4 &= 3(1) + b \\
4 &= 3 + b \\
1 &= b \\
\boxed{y &= 3x + 1}
\end{align*}
\]

(20) Find the equation of a line passing through $(-1,3), (1,5)$.

\[
m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{5 - 3}{1 - (-1)} = \frac{2}{2} = 1
\]

\[
y = 5, \quad x = 1, \quad m = 1.
\]

\[
\begin{align*}
5 &= (1)(1) + b \\
5 &= 1 + b \\
4 &= 4 \\
\boxed{y &= x + 4}
\end{align*}
\]
(21) Find the equation of the line passing through (1, 17) and (14, 17).

\[ y = 17 \]

It's a horizontal line, slope is zero.

(22) Find the equation of the line that passes through (2, 5) and is perpendicular to \(6x - 3y = 9\).

Line 1: \(6x - 3y = 9\)

\[-3y = -6x + 9\]

\[y = 2x - 3\]

So slope of line 1 is 2, so the line that's perpendicular to line 1 has slope \(-\frac{1}{2}\).

Line 2: \(y = -\frac{1}{2}x + b\)

Line 2 passes through (2, 5), so we have \(x = 2, y = 5, m = -\frac{1}{2}\)

\[5 = -\frac{1}{2}(2) + b\]

\[5 = -1 + b\]

\[6 = b\]

\[y = -\frac{1}{2}x + 6\]

(23) 8.25% of $1750 and round it to the nearest cent.

\[(1750) \left(\frac{8.25}{100}\right) = 1750 \times 0.0825 = 144.375 \approx 144.38\]
(24) Is the value 7 included in the interval (3, 7)?

No, because 7 is excluded by the parenthesis.

(25) The line $3x + 6 = x - 4$ is

(A) Horizontal

✓ (B) Vertical because it only has $x$ in it.

(C) Slanted

(26) The slope of a vertical line is __undefined__

Horizontal line is __zero__

(27) Find the $x$- and $y$-intercepts for $2x - 3y = 12$

1) To find $x$-intercept, set $y = 0$.

$2x - 3(0) = 12$

$2x = 12$

$x = 6$

$x$-intercept is (6, 0)

2) To find $y$-intercept, set $x = 0$

$2(0) - 3y = 12$

$-3y = 12$

$y = -4$

$y$-intercept is (0, -4)

(28) Find the domain for $f(x) = \sqrt{3x - 15}$

$8x - 15 \geq 0$

$3x \geq 15$

$x \geq 5$

\[ \therefore \text{domain } [5, \infty) \]
(29) Find the domain for $g(x) = \frac{2x+3}{4x-12}$.

\[4x - 12 = 0\]
\[4x = 12\]
\[x = 3\]

$x$ cannot be 3. So the domain is all real numbers except 3.

(30) If $f(x) = 7x - 4$. What is the value of $f(7)$

\[f(7) = 7(7) - 4 = 49 - 4 = 45\]

(31) Find the vertex of $f(x) = (x-7)^2 + 3$.
Since this is already in vertex form, $[7,3]$ is the answer.

(32) Find the vertex of $g(x) = x^2 + 4x + 3$.

The $x$-coordinate of the vertex of $y = ax^2 + bx + c$ is always $-\frac{b}{2a}$

\[x = -\frac{4}{2(1)} = -\frac{4}{2} = -2\]

$g(x=-2) = (-2)^2 + 4(-2) + 3 = 4 - 8 + 3 = -1$

So, the vertex is $[-2, -1]$.