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

★ solve for y.

$2x - y = 7 + 5x$

$-y = 7 + 3x$

$-y = 3x + 7$

$\boxed{y = -3x - 7}$

slope is -3, y-intercept is -7.

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

★ fill in $y = mx + b$

$y = 4$, $x = 1$, $y = mx + b$, $m = 3$

$4 = 3(1) + b$

$4 = 3 + b$

$1 = b$

$\therefore \boxed{y = 3x + 1}$

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

★ find slope first
fill in for $y = mx + b$

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

$y = 5$, $x = 1$, $m = 1$.

$5 = (1)(1) + b$

$5 = 1 + b$

$4 = 4$

$\therefore \boxed{y = x + 4}$

(21) Find the equation of the line passing through (1, 17) and (14, 17)

$\boxed{y = 17}$

☆ same y-coordinate

It's a horizontal line. slope is zero.

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

☆ find the slope first

line1: $6x - 3y = 9$

$-3y = -6x + 9$

$y = 2x - 3$

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

line2: $y = -\frac{1}{2}x + b$

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

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

$5 = -1 + b$

$6 = b$

$\therefore \boxed{y = -\frac{1}{2}x + 6}$

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

$(1750)\left(\frac{8.25}{100}\right) = 1750(0.0825) = 144.375 \approx \boxed{144.38}$

(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 $f(x)=\sqrt{3x-15}$

$3x-15\geq 0$

$3x\geq 15$

$x\geq 5$

$\therefore$ domain $[5,\infty)$

★ radicand under the square root must be nonnegative

(29) Find the domain for $g(x) = \frac{2x+3}{4x-12}$.

$4x - 12 = 0$

$4x = 12$

$x = 3$

★ denominator cannot be

x cannot be 3. So the domain is all real numbers except $\boxed{3}$

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

$f(7) = 7(7) - 4 = 49 - 4 = \boxed{45}$

(31) Find the vertex of $f(x) = (x-7)^2 + 3$.

Since this is already in vertex form, $\boxed{(7,3)}$ is the answer

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

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 $\boxed{(-2, -1)}$