Higher Objective Questions.

Unit 1

① $f(x) = 4x^3 + 5$

$f'(x) = 12x^2$

$f'(2) = 12 \times 2^2$
$= 48.$ (D).

② $u_1 = au_0 + b$
$u_1 = 4a + b$

$u_2 = au_1 + b$
$= a(4a+b) + b$
$= 4a^2 + ab + b$ (A)

③ $ax - 2y + 5 = 0.$

$2y = ax + 5$
$y = \frac{a}{2}x + \frac{5}{2}$

$m = \frac{a}{2}$

$3x + y - 4 = 0$

$y = -3x + 4$

$m = -3$

So $\frac{a}{2} = -3$
$a = -6.$ (A)

④ min $-4 + 6$
$= 2.$ (D).

⑤ midpt $\left(\frac{a}{2}, -\frac{2+b}{2}\right)$

$\frac{a}{2} = 1$
$a = 2$

$-\frac{2+b}{2} = 2$
$-2 + b = 4$
$b = 6.$ (D)

⑥ $f(g(2)) = f(-1)$
$= 2(-1)^2 - 4$
$= -2$ (D).

⑦ $L = \frac{b}{1-a}$
$= \frac{-7}{1-3}$

$= -7 \times \frac{3}{2}$

$= -\frac{21}{2}$ (A)

(8). $S = \left(\frac{5+1}{2}, \frac{3+(-7)}{2}\right)$

$= (3, -2)$ (C)

(9) cuts x-axis $y = 0$

$\Rightarrow ax + 4a = 0$

$ax = -4a$

$x = -4.$ (1) ✓

$y = -ax - 4a$

gradient depends on a. (2) ✗ (B)

(10) $y = 2x^2 - 1$

$\frac{dy}{dx} = 4x$

When $x = 0$ $\frac{dy}{dx} = 0$ (B).

(11) $f(x) = 4x^3 - x^4$

$f'(x) = 12x^2 - 4x^3$

$f'(-1) = 12 + 4$

$= 16.$ (D).

(12) $y = f(-x+3)$ moved 3 to left

reflection in y-axis

$(3,1) \to (-3,1) \to (-6,1)$

$(-1,-3) \to (1,-3) \to (-2,-3)$ (B).

(13) (B).

(14) No question!

(15) (1) ✓

(2) $u_1 = 0.5 \times 8 + 2$
$= 6.$

$L = \frac{2}{1-0.5}$
$= 4.$ ✓

(D).

(16) $f(x) = ax^2 - 2x - 5$

$f'(x) = 2ax - 2.$

When $x = 3$ $f'(x) = 0$

$2a(3) - 2 = 0$
$6a = 2$
$a = \frac{1}{3}.$

(C)

(17) $m_{PQ} = \frac{-1-(-2)}{-2-(-5)}$
$= \frac{1}{3}$

$m_{perp} = -3.$

$(y + 2) = -3(x + 5).$

(A)

(18) $\frac{k+3}{6+2} = \frac{2}{3}$

$3k + 9 = 16$
$3k = 7$
$k = \frac{7}{3}.$

(B)

(19) $f'(1) < 0$ ✓

$f'(2) < 0$ ×

(B).

(20) $f(x) = 6x^3 - 2x^{-\frac{1}{2}}$

$f'(x) = 18x^2 + x^{-\frac{3}{2}}$

(A).