

Solutions to Final Exam Review Packet

UNIT 3

$$\textcircled{1} \quad g(4) = (4)^2 - 4 = 16 - 4 = \boxed{12}$$

$$\textcircled{2} \quad h(-3) = (-3)^3 - (-3) = -27 + 3 = \boxed{-24}$$

$$\begin{aligned} \textcircled{3} \quad f(3x+4) &= 5(3x+4) - 1 = 15x + 20 - 1 \\ &= \boxed{15x + 19} \end{aligned}$$

$$\begin{aligned} \textcircled{4} \quad &2h(x) - 2g(x) \\ &= 2(x^3 - x) - 2(x^2 - 4) \\ &= 2x^3 - 2x - 2x^2 + 8 \\ &= \boxed{2x^3 - 2x^2 - 2x + 8} \end{aligned}$$

$$\textcircled{5} \quad f(2) = \boxed{4}$$

$$\textcircled{6} \quad f(4) = \boxed{1}$$

$$\textcircled{7} \quad f(\boxed{1}) = 8$$

$$\textcircled{8} \quad (7, -4), (6, -3)$$

$$\frac{-3 - (-4)}{6 - 7} = \frac{-3 + 4}{-1} = \frac{1}{-1} = \boxed{-1}$$

$$\textcircled{9} \quad f(x) = -2x + 4$$

$$f(1) = -2 + 4 = 2$$

$$f(3) = -6 + 4 = -2$$

$$(1, 2), (3, -2)$$

$$\frac{-2 - 2}{3 - 1} = \frac{-4}{2} = \boxed{-2}$$

$$\textcircled{10} \quad (1, 4), (3, 10)$$

$$\frac{10 - 4}{3 - 1} = \frac{6}{2} = \boxed{3}$$

$$\textcircled{11} \quad g(x) = 3x - 2$$

$$g(-2) = -6 - 2 = -8$$

$$g(4) = 12 - 2 = 10$$

$$(-2, -8), (4, 10)$$

$$\frac{10 - (-8)}{4 - (-2)} = \frac{18}{6} = \boxed{3}$$

$\textcircled{12}$ yes

Domain: $\{-3, 3, 4\}$

Range: $\{0, 1, 2\}$

⑬ NO

⑭ $(-6, 4)$

$(-2, 2)$

$(1, 4)$

$(5, 2)$

yes

Domain: $\{-6, -2, 1, 5\}$

Range: $\{2, 4\}$

⑮ $2, 7, 12, 17, \dots$

$$d = 5$$

$$a_n = 2 + 5(n-1)$$

$$a_n = 2 + 5n - 5$$

$$a_n = 5n - 3$$

$$a_{17} = 5(17) - 3$$

$$a_{17} = 85 - 3$$

$$a_{17} = 82$$

⑩ 8, 4, 2, 1, ...

$$a_7 = 8\left(\frac{1}{2}\right)^6$$

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

$$a_7 = \frac{1}{8}$$

$$a_n = 8\left(\frac{1}{2}\right)^{n-1}$$

⑪ a) Bailey: $B(x) = 5x + 30$

Toby: $T(x) = 10x + 20$

b) $5x + 30 = 10x + 20$

$$\begin{array}{r} -10x \qquad \qquad -10x \\ \hline \end{array}$$

$$-5x + 30 = 20$$

$$\begin{array}{r} -30 \quad -30 \\ \hline \end{array}$$

$$\underline{-5x} = \underline{-10}$$

$$\underline{-5} \qquad \underline{-5}$$

$$x = 2$$

on day 2

⑮ Domain: $(-\infty, \infty)$

Range: $(-\infty, \infty)$

x-intercept: $(-3, 0)$

y-intercept: $(0, -2)$

Interval of Increase: None

Interval of Decrease: $(-\infty, \infty)$

Maximum Point: None

Minimum Point: None

End Behavior:

As $x \rightarrow \infty$, $y \rightarrow -\infty$

As $x \rightarrow -\infty$, $y \rightarrow +\infty$

$$(19) \quad a_0 = 80$$

$$a_n = -5n + 80$$

$$a_6 = -5(6) + 80$$

$$a_6 = -30 + 80$$

$$a_6 = 50$$

50 dolls left

$$(20) \quad y = 12500(1 - 0.07)^t$$

$$y = 12500(0.93)^t$$

$$y = 12500(0.93)^{10}$$

$$y = \$6,049.78$$

$$\textcircled{21} \quad y = 1.2(1 + 0.03)^t$$

$$y = 1.2(1.03)^t$$

$$\textcircled{22} \quad f(x) = 3^x \quad h(x) = -2(3)^{x+1}$$

- reflect across the x -axis

- stretch by a scale factor of 2

- left 1

$$\textcircled{23} \quad g(x) = \frac{1}{4} 3^{x-2} + 5$$

Domain: $(-\infty, \infty)$

Range: $(5, \infty)$

Asymptote: $y = 5$

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$$-f(x) + 2$$

$(-2, 1)$

$(-1, -1)$

$(0, 2)$

$(1, 1)$

$(2, 3)$

$(3, 0)$

reflect

$(-2, -1)$

$(-1, 1)$

$(0, -2)$

$(1, -1)$

$(2, -3)$

$(3, 0)$

up 2

$(-2, 1)$

$(-1, 3)$

$(0, 0)$

$(1, 1)$

$(2, -1)$

$(3, 2)$

25 $2f(x) - 1$

$(-2, 1)$

$(-1, -1)$

$(0, 2)$

$(1, 1)$

$(2, 3)$

$(3, 0)$

stretch

$(-2, 2)$

$(-1, -2)$

$(0, 4)$

$(1, 2)$

$(2, 6)$

$(3, 0)$

down 1

$(-2, 1)$

$(-1, -3)$

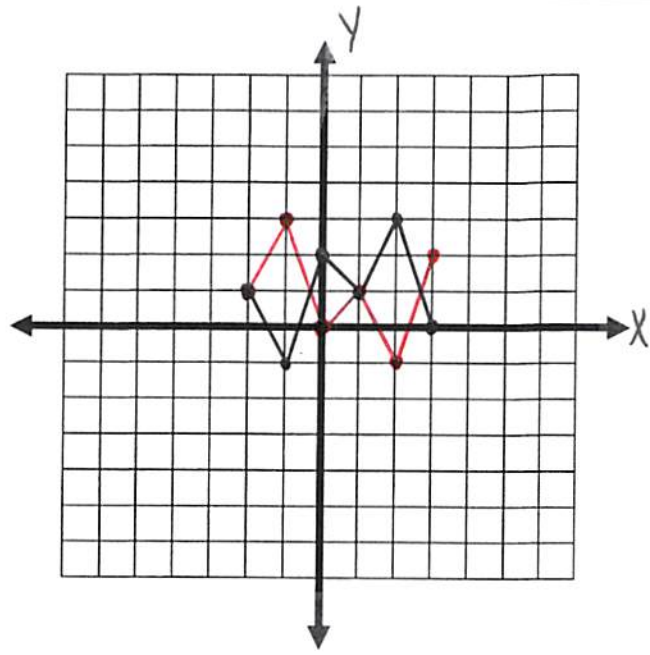
$(0, 3)$

$(1, 1)$

$(2, 5)$

$(3, -1)$

#24



#25

