

October 28, 2015
Exam # 2 70/100 or 60/40

Functions & Relations
Linear functions
Algebra of Functions
Radicals
Solving Equations
Laws of Exponents
Factoring polynomials
Fractions
Complex Numbers

Oct 28-10:00 AM

9.2
#43) $g(x) = x^3 - 2x^2 - 2x + 1$

(a) $g(-1)$
(b) $g(x+h)$
(c) $\frac{g(x+h) - g(x)}{h}$

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(a) $g(-1) = (-1)^3 - 2(-1)^2 - 2(-1) + 1$
 $= -1 - 2 + 2 + 1$
 $= 0$

(b) $g(x+h) = (x+h)^3 - 2(x+h)^2 - 2(x+h) + 1$
 $= (x+h)(x+h)(x+h) - 2(x+h)(x+h) - 2(x+h) + 1$
 $= (x^2 + 2xh + h^2)(x+h) - 2(x^2 + 2xh + h^2) - 2x - 2h + 1$
 $= x^3 + x^2h + 2xh^2 + 2xh^2 + xh^3 + h^3 - 2x^2 - 4xh - 2h^2 - 2x - 2h + 1$
 $= x^3 + 3x^2h + 3xh^2 - 2x^2 - 2h^2 - 4xh - 2x - 2h + 1 + h^3$

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(c) $\frac{g(x+h) - g(x)}{h}$
 $x^3 - 2x^2 \dots$

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$(-1, -3)$; $m = \frac{2}{3}$
 $y - y_1 = m(x - x_1)$
 $y - (-3) = \frac{2}{3}(x - (-1))$
 $y + 3 = \frac{2}{3}(x + 1)$
 $3y + 9 = 2(x + 1)$
 $3y + 9 = 2x + 2$
 $-2x + 3y = -7$
 $2x - 3y = 7$ $\cdot 3$
 $\frac{-3y}{-3} = \frac{-2x}{-3} + \frac{7}{-3}$
 $y = \frac{2}{3}x - \frac{7}{3}$ $\cdot 1$

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$f(x) = 3x + 1$ $g(x) = 2x^2 - x + 4$
 find $(f \circ g)(-1) = f(g(-1))$
 $= 3(2(-1)^2 - (-1) + 4) + 1$
 $= 3(2(1) + 1 + 4) + 1$
 $= 3(2 + 1 + 4) + 1$
 $= 3(7) + 1$
 $= 21 + 1$
 $= 22$

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$$\begin{aligned}
 f(x) &= 3x + 1 & g(x) &= 2x^2 - x + 4 \\
 \textcircled{1} (g \circ f)(x) &= g(f(x)) \\
 &= 2(3x+1)^2 - (3x+1) + 4 \\
 &= 2(9x^2 + 6x + 1) - 3x - 1 + 4 \\
 &= 2(3(-1)+1)^2 - (3(-1)+1) + 4 \\
 &= 2(-3+1)^2 - (-3+1) + 4 \\
 &= 2(-2)^2 - (-2) + 4 \\
 &= 2(4) + 2 + 4 \\
 &= 8 + 2 + 4 \\
 &= 10 + 4 \\
 &= 14
 \end{aligned}$$

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$$\begin{aligned}
 (2, 0) & ; \text{ parallel to } y = \frac{2}{3}x \\
 m &= \frac{2}{3} \\
 y - 0 &= \frac{2}{3}(x - 2) \\
 3y - 0 &= 2(x - 2) \\
 3y &= 2x - 4 \\
 -2x + 3y &= -4 \\
 \boxed{2x - 3y} &= 4
 \end{aligned}$$

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$$\begin{aligned}
 (2, 0) & \rightarrow m = \frac{2}{3} \\
 (5, 2) & \\
 (-1, -2) & \\
 2(5) - 3(2) &= 4 \\
 10 - 6 &= 4 \\
 4 &= 4
 \end{aligned}$$

Oct 28-10:40 AM

$$\begin{aligned}
 8x - 3y &= 24 \\
 \text{find slope } (m) & \rightarrow \text{Slope-Intercept form} \\
 & \text{i.e. solve for 'y'} \\
 -3y &= -8x + 24 \\
 \frac{-3y}{-3} &= \frac{-8x + 24}{-3} \\
 y &= \frac{8}{3}x - 8 \\
 & \downarrow \quad \quad \downarrow \\
 & m \quad \quad \text{y-intercept} \\
 & \quad \quad (0, -8)
 \end{aligned}$$

Oct 28-10:44 AM