Math 1010

10/4/2012 - Chapter 5 Review

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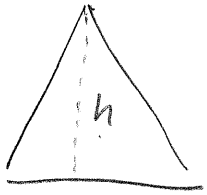

$b = h - 3$

$11 - 3 = 8$

$A = 44$

$A = \frac{1}{2} b h$

$$44 = \frac{1}{2}(h-3)h$$

$$44 = \left(\frac{1}{2}h - \frac{3}{2}\right)h$$

$$44 = \frac{1}{2}h^2 - \frac{3}{2}h$$

$-44 \qquad -44$

$$2 \cdot 0 = \frac{1}{2}h^2 \cdot 2 - \frac{3}{2}h \cdot 2 - 44 \cdot 2$$

$$0 = h^2 - 3h - 88$$

-88	-3
-11, 8	-3 ✓

$-11, 8$

$$0 = (h-11)(h+8)$$

$h - 11 = 0 \qquad h + 8 = 0$

$+11 \quad +11 \qquad -8 \quad -8$

$h = 11, \cancel{h = -8}$

$$\boxed{\begin{array}{l} \text{height} = 11 \text{ m} \\ \text{base} = 8 \text{ m} \end{array}}$$

#62 two consecutive integers

1st : x

2nd : $x+1$

$$x(x+1) = 72$$

$$x^2 + x = 72$$
$$-72 \quad -72$$

$$x^2 + x - 72 = 0$$

$$(x-8)(x+9) = 0$$

$$x - 8 = 0 \qquad x + 9 = 0$$
$$+8 \quad +8 \qquad -9 \quad -9$$

$$x = 8 \qquad x = -9$$

8, 9 | -9, -8

$$\boxed{8,9 \quad \text{and} \quad -9,-8}$$

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Composition of functions

$f(x) = 3x + 2$, $g(x) = x^2 + 2x - 5$

$(f \circ g)(x) = 3(x^2 + 2x - 5) + 2$

outer inner input

$= 3x^2 + 6x - 15 + 2$

$(f \circ g)(x) = 3x^2 + 6x - 13$

$(g \circ f)(x) = (3x+2)^2 + 2(3x+2) - 5$

$= (3x+2)(3x+2) + 6x + 4 - 5$

$= 9x^2 + 6x + 6x + 4 + 6x + 4 - 5$

$(g \circ f)(x) = 9x^2 + 18x + 3$

$f(x) = 9x + 10$ $g(x) = 3x + 7$

way 1

$(f \circ g)(-2) = f(g(-2)) = f(3(-2) + 7) = f(-6 + 7)$

$= f(1)$

$f(1) = 9(1) + 10 = 19$

way 2

$$(f \circ g)(-2) = 9(3(-2)+7) + 10$$
$$= 9(-6+7) + 10$$
$$= 9(1) + 10$$
$$= 19$$

Multiplying functions

$f(x) = 9x + 10 \qquad g(x) = 3x + 7$

$(f \cdot g)(x) = (fg)(x) \leftarrow$ multiply

$(f \circ g)(x) \leftarrow$ composition

$$(fg)(x) = f(x) \cdot g(x)$$
$$= (9x+10)(3x+7)$$
$$= 27x^2 + 63x + 30x + 70$$
$$(fg)(x) = 27x^2 + 93x + 70$$

$$\frac{p^3 + 3p^2 - 4}{p+2} = \boxed{p^2 + p - 2}$$

$$
\begin{array}{r|l}
 & p^2 + p - 2 \\
\hline
p + 2 & \cancel{p^3} + 3p^2 + 0p - 4 \\
 & -\cancel{p^3} + {}^-2p^2 \\
\hline
 & \cancel{p^2} + 0p \\
 & -\cancel{p^2} + {}^-2p \\
\hline
 & -\cancel{2p} - \cancel{4} \\
 & +\cancel{2p} + \cancel{4} \\
\hline
 & 0
\end{array}
$$

$f(t)$ = $(3t^4 + 5t^3 - 8t^2 - 13t + 2) \div (t^2 - 5)$ = $g(t)$

$$
\begin{array}{r|l}
 & 3t^2 + 5t + 7 \\
\hline
t^2 + 0t - 5 & \cancel{3t^4} + 5t^3 - 8t^2 - 13t + 2 \\
 & -\cancel{3t^4} + {}^-0t^3 + 15t^2 \\
\hline
 & \cancel{5t^3} + 7t^2 - 13t \\
 & -\cancel{5t^3} + {}^-0t^2 + 25t \\
\hline
 & \cancel{7t^2} + 12t + 2 \\
 & \cancel{7t^2} + {}^-0t + 35 \\
\hline
 & 12t + 37
\end{array}
$$

$\frac{3t^{4\,2}}{\cancel{t^2}} = 3t^2$

$\frac{5t^{3}}{\cancel{t^2}} = 5t$

$\left(\frac{f}{g}\right)(t) =$

Ans: $3t^2 + 5t + 7 + \frac{12t + 37}{t^2 - 5}$