9/25/2012 - Sec 5.5 Math 1010

5.3

#54

#36

#30

#51

#30 $(g+h)\left(\frac{1}{3}\right)$; $g(x) = 2x$; $h(x) = x-3$

$= (g+h)\left(\frac{1}{3}\right)$

$= g\left(\frac{1}{3}\right) + h\left(\frac{1}{3}\right)$

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

$= \underbrace{\frac{2}{3} + \frac{1}{3}}_{1} - 3$

$= \boxed{-2}$

#36 $\underset{\text{outer}}{(f} \circ \underset{\text{inner}}{g)}(\underset{\text{input}}{4})$; $f(x) = x^2+4$, $g(x) = 2x+3$

$f(g(4)) = f(2 \cdot 4 + 3) = f(11)$

$= (11)^2 + 4$

$= 121 + 4 = \boxed{125}$

#51

input is feet

input is miles

$f(x) = 12x$

$g(x) = 5280x$

output is inches

output is feet

input is miles

$(f \circ g)(x) = f(g(x)) = f(5280x)$

$= 12(5280x) = 63360x$

output is inches

what does it compute

Computes the # of inches given the # of miles.

$(f \circ g)(x) = 63360x$

#54

minute since leak began

Radius of circle

$r(t) = 4t$

$A(r) = \pi r^2$

Radius in ft

Area of Circle

outer

inner

Find $(A \circ r)(t) = A(r(t))$

Interpret

$= \pi(4t)^2$

$= \pi \cdot 4^2 t^2 = 16\pi t^2 = (A \circ r)(t)$

Interpret Area after t minutes

When interpreting composition functions

$$(f \circ g)(x) = f(g(x))$$

Output of f in terms of input of g

or

Given by

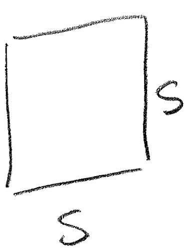
or

after

#52 $\underset{\text{Perimeter}}{X} = 4\underset{\text{side}}{s}$

a) $\dfrac{x}{4} = \dfrac{4s}{4}$

$s = \dfrac{x}{4} \Rightarrow \underbrace{S}_{\text{output is side length}}(\underbrace{x}_{\text{input perimiter}}) = \dfrac{x}{4}$



b) $A = s^2 \Rightarrow \underbrace{A(s)}_{\text{output is Area of Square}} = \underbrace{s^2}_{\text{input side length}}$

$$(A \circ S)(x) = A(S(x))$$

Output of outer = area of sq

input of inner = perimeter

$$= A\left(\frac{x}{4}\right)$$

Interpret: Area of sq determined by perimeter

$$= \left(\frac{x}{4}\right)^2 = \frac{x^2}{16} = \underline{\underline{(A \circ s)(x)}}$$

Sec 5.5 Dividing Polynomials

Dividing by monomial

$$\frac{a}{b} + \frac{c}{b} = \frac{a+c}{b}$$

Ex: $$\frac{15x^2+24x-12}{3} = \frac{\overset{5}{\cancel{15}}x^2}{\underset{1}{\cancel{3}}} + \frac{\overset{8}{\cancel{24}}x}{\cancel{3}} - \frac{\overset{4}{\cancel{12}}}{\cancel{3}}$$

$$= \boxed{5x^2 + 8x - 4}$$

Ex: $$\frac{4x^4 - 7x^3 + 12x^2}{4x^3}$$

$$\frac{\cancel{4}x^{\cancel{4}\,1}}{\cancel{4}\cancel{x^3}} - \frac{7\cancel{x^3}}{4\cancel{x^3}} + \frac{\overset{3}{\cancel{12}}\cancel{x^2}}{\cancel{4}x^{\cancel{3}\,1}}$$

$$\boxed{x - \frac{7}{4} + \frac{3}{x}}$$

Review:

$$\begin{array}{r} 1\;9\;1\;1 + \frac{4}{23} \\ 23\overline{)\,43957} \\ -23 \\ \hline 209 \\ -207 \\ \hline 25 \\ -23 \\ \hline 27 \\ -23 \\ \hline 4 \end{array}$$

Divide $\dfrac{2m^2+m-10}{m-2} = 2m+5$

1st Set up :

$$\begin{array}{r} 2m+5 \\ m-2\overline{)\,2m^2+m-10} \\ -\cancel{2}m^2 + {}^{+}4m \\ \hline 5\cancel{m}-10 \\ -\cancel{5}m + {}^{+}10 \\ \hline 0 \end{array}$$

$\dfrac{2m^2}{m} = \boxed{2m}$

$\dfrac{5m}{m} = 5$

2nd Asked your self inorder to find the # for above

3rd multiplied

4th Subtracted (made sure the first term went 0)

5th Brought down Next term

6th Repeated until No more terms to Bring Down

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$$(4x^3+9x^2-10x+3) \div (4x+1)$$

$$
\begin{array}{r}
x^2+2x-3 \\
* \; 4x+1 \,\overline{)\, 4x^3+9x^2-10x+3} \\
-\cancel{4x^3} \mp x^2 \qquad\qquad \\
\hline
\cancel{8x^2}-10x \qquad \\
-\cancel{8x^2} \mp 2x \qquad \\
\hline
-\cancel{12x}+3 \\
+\cancel{12x}+3 \\
\hline
6
\end{array}
$$

$\frac{4x^3}{4x} = x^2$

$\frac{8x^2}{4x} = 2x$

$\frac{-12x}{4x} = -3$

← degree is less than the degree here * I'm done dividing

$$\boxed{x^2+2x-3+\frac{6}{4x+1}}$$

39 $(3x^3-x+4) \div (x-2)$

$$x-2 \,\overline{)\, 3x^3+0x^2-x+4}$$

Divide function

If $f(x)$ and $g(x)$ define functions

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

Domain is the common domain between $f(x)$ and $g(x)$ and excludes any x that makes $g(x) = 0$