Tutorial Sheet **2425-MA140**
Assignment Assignment-1 due 10/04/2024 at 05:01pm BST

Problem 1. **(1 point)** Library/Michigan/Chap7Sec4/Q01.pg

Split into partial fractions:

$$\frac{42}{49-x^2} = \_\_\_\_\_ + \_\_\_\_\_$$

Problem 2. **(1 point)** Library/maCalcDB/setAlgebra26PartialFraction/srw8_9_21.pg

The partial fraction decomposition of $\frac{26x}{8x^2-10x+3}$ can be written in the form of $\frac{f(x)}{2x-1} + \frac{g(x)}{4x-3}$, where

$f(x) =$ _____,
$g(x) =$ _____.

Problem 3. **(1 point)** Library/WHFreeman/Holt_linear_algebra/Chaps_1-4/holt_01_04_022.pg

When using partial fractions to find antiderivatives in calculus we decompose complicated rational expressions into the sum of simpler expressions that can be integrated individually. The required decomposition is

$$\frac{49}{x(x^2+7)} = \frac{A}{x} + \frac{Bx+C}{x^2+7}$$

Find the values of the missing constants.

$A =$ ___
$B =$ ___
$C =$ ___

Problem 4. **(1 point)** Library/maCalcDB/setAlgebra26PartialFraction/srw8_9_25.pg

The partial fraction decomposition of $\frac{x^2+45}{x^3+x^2}$ can be written in the form of $\frac{f(x)}{x} + \frac{g(x)}{x^2} + \frac{h(x)}{x+1}$, where

$f(x) =$ _____,
$g(x) =$ _____,
$h(x) =$ _____.

Problem 5. **(1 point)** Library/Valdosta/APEX_Calculus/1.3/APEX_1.3_6-13.pg

Suppose

$$\lim_{x\to a} h(x) = 5, \ \lim_{x\to a} g(x) = -4, \ \lim_{x\to a} f(x) = 0.$$

Find following limits if they exist. Enter **DNE** if the limit does not exist.

___1. $\lim_{x\to a} h(x) + g(x)$
___2. $\lim_{x\to a} h(x) - g(x)$
___3. $\lim_{x\to a} h(x) \cdot f(x)$
___4. $\lim_{x\to a} \frac{h(x)}{g(x)}$
___5. $\lim_{x\to a} \frac{h(x)}{f(x)}$
___6. $\lim_{x\to a} \frac{f(x)}{h(x)}$
___7. $\lim_{x\to a} (g(x))^2$
___8. $\lim_{x\to a} \frac{1}{g(x)}$
___9. $\lim_{x\to a} \frac{1}{g(x) - f(x)}$

Problem 6. **(1 point)** Library/Union/setLimitConcepts/s1_3_36.pg

Evaluate the limit

$$\lim_{t\to 7} \frac{\frac{1}{t} - \frac{1}{7}}{t-7}.$$

(If the limit does not exist, enter "DNE".)

Limit = _____

Problem 7. **(1 point)** Library/UVA-Stew5e/setUVA-Stew5e-C03S04-DerivsTrig/3-4-43.pg

Evaluate

$$\lim_{\theta\to 0} \frac{3\sin\theta}{\theta + 2\tan\theta}.$$

Limit = _____

Problem 8. **(1 point)** Library/270/setLimitsRates2Limits/ur_lr_2_11.pg

If

$$-6x - 5 \le f(x) \le x^2 - 6x - 5$$

determine $\lim_{x\to 0} f(x) =$ _____

What theorem did you use to arrive at your answer?

_____