DOCUMENT(); # This should be the first executable line in the problem.

loadMacros(

"PGstandard.pl",

"MathObjects.pl",

"contextLimitedPolynomial.pl",

"PGunion.pl",

"parserPopUp.pl",

"scaffold.pl",

"answerCustom.pl",

);

TEXT(beginproblem());

$showPartialCorrectAnswers = 1;

Context("Numeric");

$a = random(2,5,1) \* random(-1,1,2);

$b = random(2,5,1) \* random(-1,1,2);

$c = non\_zero\_random(-9,9,1);

$d = random(3,6,1);

$emd = random(-1,1,2);

$e = $d + $emd;

$f = non\_zero\_random(-9,9,1);

###########################################

Context()->texStrings;

BEGIN\_TEXT

$BBOLD Question $EBOLD $BR $BR

Solve the system using Gauss-Jordan elimination

\[ \begin{array}{r${NO\_SPACE}r${NO\_SPACE}r${NO\_SPACE}r${NO\_SPACE}r}

 x\_1 & + x\_2 & + $a x\_3 & = & $c \cr

$d x\_1 & + $e x\_2 & + $b x\_3 & = & $f \cr

\end{array} \]

$BR

$BR

$HR

$BBOLD Solution $EBOLD $BR $BR

END\_TEXT

Context()->normalStrings;

###########################################

# The scaffold

Scaffold::Begin();

###########################################

Section::Begin("General solution");

Context("Numeric");

$k = $a - $emd \* ($b - $a\*$d);

$l = $emd \* ($b - $a\*$d);

$m = $c - $emd \* ($f - $c\*$d);

$n = $emd \* ($f - $c\*$d);

Context("LimitedPolynomial-Strict");

Context()->variables->add("x3"=>'Real');

$x1Value = Compute("$m -$k x3");

$x2Value = Compute("$n - $l x3");

Context("Point");

$P = Point($m,$n,0);

Context("Vector");

Context()->{cmpDefaults}{Vector} = {promotePoints => 1};

Context()->lists->set(Vector=>{open=>'(', close=>')'});

Context()->variables->are(t=>"Real");

$V = Vector(-$k,-$l,1);

# for checking a particular vector parametric line

sub mycheck {

 my ($correct, $student, $ansHash) = @\_;

 if (

 ($correct . i == $student . i) &&

 ($correct . j == $student . j) &&

 ($correct . k == $student . k)

 )

 { return 1; } else { return 0; }

}

$T = Formula("t");

$Answer = $P + $T \* $V;

Context()->texStrings;

BEGIN\_TEXT

Thus, the general solution is $BR $BR

\( \quad (x\_1,x\_2,x\_3) = \) \{ ans\_rule(25) \} $BR $BR

$HR

$BBOLD Note : $EBOLD Write the general solution in one of the following format : $BR

\( \quad P \) $BR

\( \quad P + t \vec{v} \) $BR

\( \quad P + s \vec{v} + t \vec{w} \)$BR

\( \quad none \)

END\_TEXT

Context()->normalStrings;

#ANS($Answer->cmp);

ANS( custom\_cmp( $Answer, ~~&mycheck, showCoordinateHints=>1 ) );

Section::End();

Scaffold::End();

COMMENT("This problem gives infinitely many solutions");

ENDDOCUMENT(); # This should be the last executable line in the problem.