

# Introduction to Engineering – Assignment 01

#	Student ID	Student Name	Grade (10)
-			

Delivery Date	
---------------	--

<p>١. يتم تسليم التمرين محلولا في خلال أسبوع من تاريخ التمرين، و يتم حذف درجتين من التمرين عن كل أسبوع تأخير ٢. يتم التسليم لمعيد المقرر مباشرة ٣. تتم أجابه التمرين في نفس ورق الأسئلة</p>
---



Faculty of Engineering

Q 1	<b>Calculate:</b>  (a) $\frac{22 + 5.1^2}{50 - 6.3^2}$ (b) $\frac{44}{7} + \frac{8^2}{5} - \frac{99}{3.9^2}$
So   1	.....  ..... Script file: .....  ..... clear, clc ..... ..... disp('Part (a)') ..... .....     (22+5.1^2) / (50-6.3^2) ..... ..... disp('Part (b)') ..... .....     44/7+8^2/5-99/3.9^2 .....  ..... ..... Command Window: .....  ..... Part (a) ..... ..... ans = ..... .....       4.6566 ..... ..... Part (b) ..... ..... ans = ..... .....       12.5768 .....  .....  .....  .....  .....  .....  .....



FACULTY OF ENGINEERING  
AHRAM CANADIAN UNIVERSITY

كلية الهندسة

Faculty of Engineering



جامعة الأهرام الكندية  
AHRAM CANADIAN UNIVERSITY

Q 2	<p><b>Calculate:</b></p> <p>(b) <math>\sin^2 80^\circ - \frac{(\cos 14^\circ \sin 80^\circ)^2}{\sqrt[3]{0.18}}</math></p>
So 12	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <pre> disp('Part (b)') %alternatives: could use nthroot(0.18,3), could convert to radians %and use regular trig functions sind(80)^2 - (cosd(14)*sind(80))^2 / (0.18)^(1/3)         </pre> <p>.....</p> <p>.....</p> <p>.....</p> <pre> ''' Part (b) ... ans =       -0.6473         </pre> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>



Q3	<p>Define the variables <math>a</math>, <math>b</math>, <math>c</math>, and <math>d</math> as:</p> <p><math>a = 12</math>, <math>b = 5.6</math>, <math>c = \frac{3a}{b^2}</math>, and <math>d = \frac{(a-b)^c}{c}</math>, then evaluate:</p> <p>(a) <math>\frac{a}{b} + \frac{d-c}{d+c} - (d-b)^2</math></p>
Sol 3	<p>.....</p> <p>.....</p> <p>.... Script file: .....</p> <p>....</p> <pre>clear, clc a=12; b=5.6; c=3*a/b^2; d=(a-b)^c/c; disp('Part (a)') a/b+(d-c)/(d+c)-(d-b)^2</pre> <p>....</p> <p>....</p> <p>.... Command Window: .....</p> <p>....</p> <pre>Part (a) ans = -0.1459</pre> <p>....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>



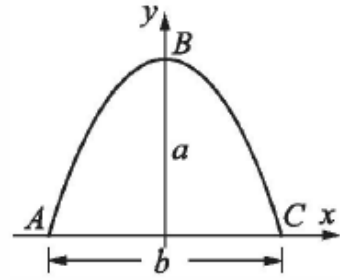
Faculty of Engineering

Q4

The arc length of a segment of a parabola  $ABC$  of an ellipse with semi-minor axes  $a$  and  $b$  is given approximately by:

$$L_{ABC} = \frac{1}{2} \sqrt{b^2 + 16a^2} + \frac{b^2}{8a} \ln \left( \frac{4a + \sqrt{b^2 + 16a^2}}{b} \right).$$

(a) Determine  $L_{ABC}$  if  $a = 11$  in. and  $b = 9$  in.



Sol 4

.....  
... Script file: .....

```
... clear, clc
... a=11; b=9;
... %could be one long expression
... s=sqrt(b^2+16*a^2);
... Labc = s/2 + b^2/(8*a)*log((4*a+s)/b)
```

... Command Window: .....

```
... Labc =
      24.5637
```

<p>Q5</p>	<p>Two trigonometric identities are given by:</p> <p>(a) <math>\sin 5x = 5 \sin x - 20 \sin^3 x + 16 \sin^5 x</math></p> <p>For each part, verify that the identity is correct by calculating the values of the left and right sides of the equation, substituting <math>x = \frac{\pi}{12}</math>.</p> <p>Two trigonometric identities are given by:</p> <p>(a) <math>\tan 3x = \frac{3 \tan x - \tan^3 x}{1 - 3 \tan^2 x}</math></p> <p>For each part, verify that the identity is correct by calculating the values of the left and right sides of the equation, substituting <math>x = 24^\circ</math>.</p>
<p>Sol 5</p>	<pre> Script file: .... ....clear, clc ....x=pi/12; ....disp('Part (a)') ....%compare LHS and RHS ....LHS = sin(5*x) ....RHS = 5*sin(x)-20*sin(x)^3+16*sin(x)^5 .... .... .... .... Command Window: .... ....Part (a) ....LHS = ....0.9659 ....RHS = ....0.9659 ..... </pre>

