Assignment 1

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Submitted April 8th 2025

Assignment submitted for **Aerospace Propulsion** at the University of Adelaide.
Due 23:59pm April 11th 2025

Please see email evidence of extension, and access plan at the end of this document

Contents

List of Figures

1. Consider a turbojet engine with inlet cross-sectional area of $A_1 = 0.1$ m^2 being tested under static conditions at sea level (assume standard day conditions)

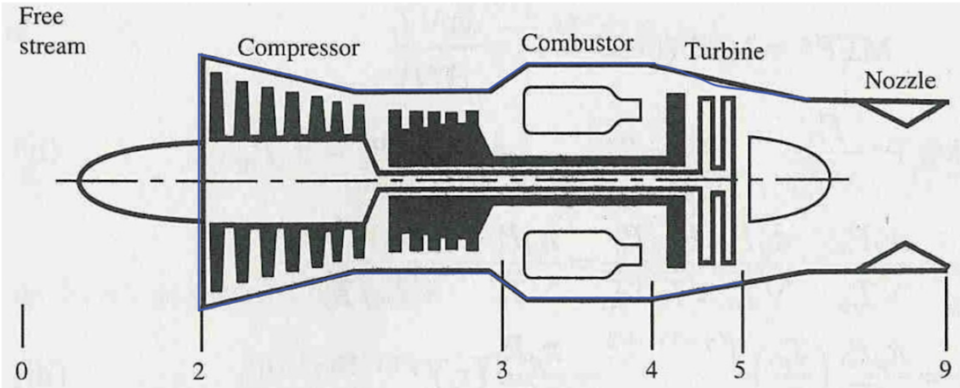

Figure 1: Turbojet diagram from lecture slides

Standard day conditions @ sea level from altitude tables:

$$P_{\text{std}} = P_0 = 101325 \text{ Pa} \qquad \rho_{\text{std}} = \rho_0 = 1.225 \text{ kgm}^{-3}$$

$$T_{\text{std}} = T_0 = 288.15 \text{ K} \qquad a_{\text{std}} = 340 \text{ ms}^{-1}$$

(a) Formulate an expression (in it's simplest form) for the mass flow rate, $\dot{m}$, in terms of known (or easily calculated) parameters: (ambient pressure P_0, ambient temperature T_0, inlet area A_1, ratio of specific heats γ, and specific gas constant R), and the flow Mach no. at the inlet (M_1). Using Matlab, plot M_1 as a function of mass flow rate for a Mach no. range of 0 < M_1 < 1.

Known / given:

$$A_1 = 0.1 \text{ m}^2 \qquad \gamma = 1.4$$

$$M_0 = 0 \qquad R = 287.05 \text{ Jkg}^{-1}\text{K}^{-1}$$

Mass flow rate @ inlet:

$$\dot{m} = \rho_1 A_1 V_1$$

Assuming ideal gas. Since $P = \rho RT$ and $a^2 = \gamma RT \Rightarrow V = M\sqrt{\gamma RT}$:

$$\Rightarrow \dot{m} = \frac{P_1}{RT_1} A_1 M_1 \sqrt{\gamma R T_1} \tag{1}$$

Isentropic flow relations:

$$\begin{aligned} \frac{T_t}{T} &= 1 + \frac{\gamma - 1}{2} M^2 \\ &\Rightarrow T_1 = T_{t1} / \left(1 + \frac{\gamma-1}{2} M_1^2\right) \\ \frac{P_t}{P} &= \frac{T_t}{T}^{\frac{\gamma}{\gamma-1}} = \left(1 + \frac{\gamma-1}{2} M^2\right)^{\frac{\gamma}{\gamma-1}} \\ &\Rightarrow P_1 = P_{t1} / \left(1 + \frac{\gamma-1}{2} M_1^2\right)^{\frac{\gamma}{\gamma-1}} \end{aligned} \tag{2}$$

Substituting (2) to (1):

$$\begin{aligned}
\dot{m} &= \frac{P_{t1}}{\left(1+\frac{\gamma-1}{2}M_1^2\right)^{\frac{\gamma}{\gamma-1}} RT_1} A_1 M_1 \sqrt{\gamma R T_1} \\
&= \frac{P_{t1}}{\left(1+\frac{\gamma-1}{2}M_1^2\right)^{\frac{\gamma}{\gamma-1}}} A_1 M_1 \sqrt{\frac{\gamma}{RT_1}} \\
&= \frac{P_{t1}}{\left(1+\frac{\gamma-1}{2}M_1^2\right)^{\frac{\gamma}{\gamma-1}}} A_1 M_1 \sqrt{\frac{\gamma\left(1+\frac{\gamma-1}{2}M_1^2\right)}{RT_{t1}}} \\
&= \frac{P_{t1}}{\sqrt{T_{t1}}}\sqrt{\frac{\gamma}{R}}\left(1+\frac{\gamma-1}{2}M_1^2\right)^{\frac{1}{2}-\frac{\gamma}{\gamma-1}} A_1 M_1 \\
&\boxed{= \frac{P_0}{\sqrt{T_0}}\sqrt{\frac{\gamma}{R}}\left(1+\frac{\gamma-1}{2}M_1^2\right)^{\frac{-(\gamma+1)}{2(\gamma-1)}} A_1 M_1} \qquad (3)
\end{aligned}$$

See end of Question 1 for Matlab code.

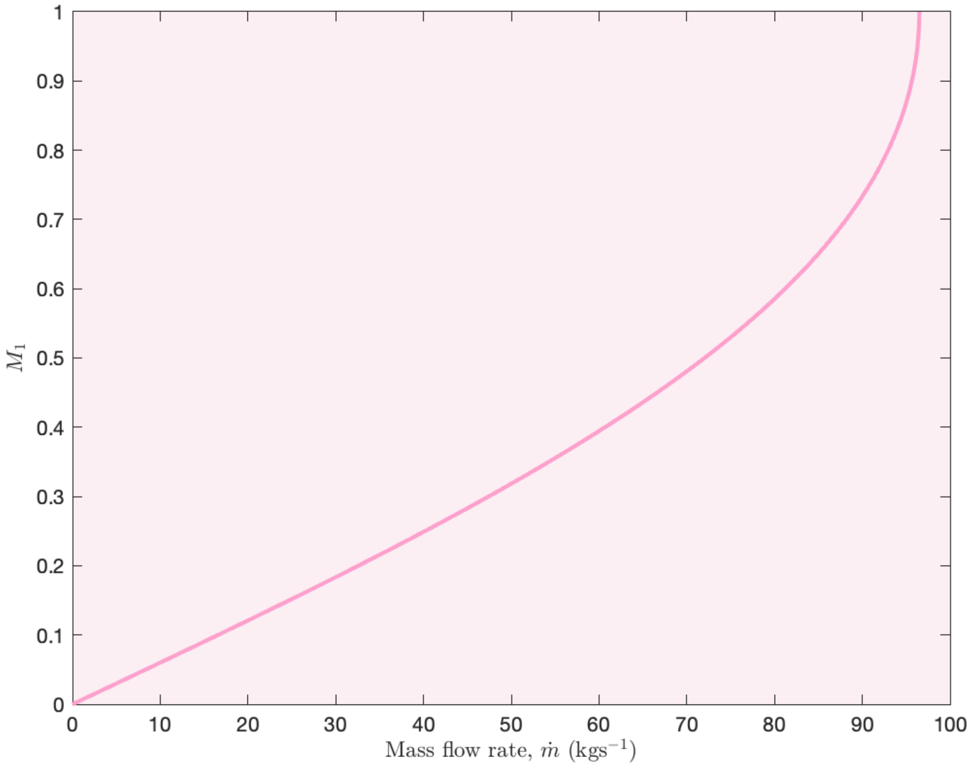

Figure 2: Mass flow rate $\dot{m}$ as a function of inlet mach number, M_1.

(b) If the mass flow rate of air entering the engine is measured to be 80 $\mathbf{kgs^{-1}}$, what is the inlet mach number M_1?

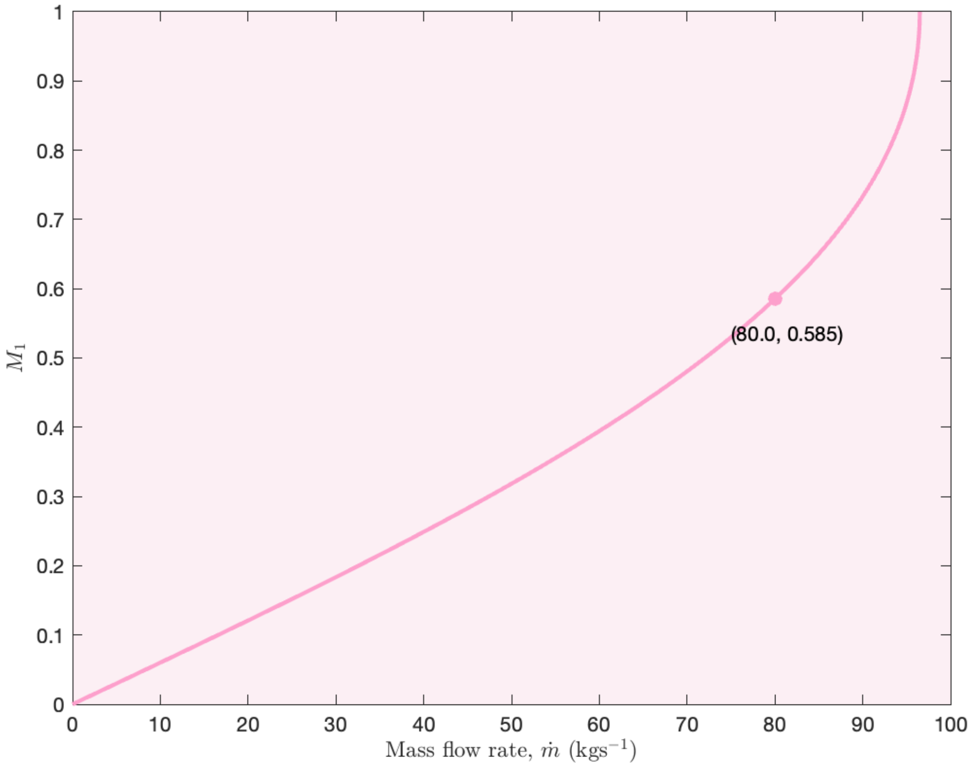

Figure 3: Mach number at $\dot{m} = 80$ $\mathrm{kgs^{-1}}$.

From Figure 3, at $\dot{m} = 80$ $\mathrm{kgs^{-1}}$:

$$\boxed{M_1 = 0.585} \tag{4}$$

(c) Determine the additive drag of the inlet for the 80.0 $\mathbf{kgs^{-1}}$ mass flow rate by considering Mattingly's formulation of additive drag: $D_{add} = P_1A_1(1 + \gamma M_1^2) - P_0A_0\gamma M_0^2 - P_0A_1$.

Since $P_{t1} = P_0$, substituting (4) to (2):

$$\begin{aligned} P_1 &= P_0 / \left(1 + \frac{\gamma - 1}{2}M_1^2\right)^{\frac{\gamma}{\gamma-1}} \\ &= 80347.493 \text{ Pa} \end{aligned}$$

And since $M_0 = 0$:

$$D_{add} = P_1A_1(1 + \gamma M_1^2) - P_0A_1 \tag{5}$$

Substituting known values, $M_1 = 0.585$, and P_1 to (5):

$$\boxed{D_{add} = 7024.935 \text{ N}} \tag{6}$$

Matlab code

q1.m

```matlab
clear;
clc;
clf;

%standard day sea level conditions
P_0 = 101325; %Pa
T_0 = 288.15; %K
```

```
rho_0 =1.225; %kgm-3
a_std = 340; %ms-1

%known/given
A_1 = 0.4; %m2
M_0 = 0;
k = 1.4;
R = 287.05; %Jkj-1K-1

%% part a
M_1 = 0:0.01:1; %initialise variable M_1 to be 0 < M_1 < 1 with a step size of 0.01
%calculate mass flow rate from derived equation
mdot = (P_0 / sqrt(T_0)) .* sqrt(k / R) .* ((1 + (((k - 1) / 2) .* (M_1 .^ 2))) .^ ((-(k + 1)) / (2 .* (k - 1)))) .* A_1 .* M_1;
plot(mdot, M_1, "color", "#fda0cc", "LineWidth", 2); %plot and export
set(gca,"Color","#fceff4")
xlabel("Mass flow rate, $\dot{m}$ (kgs$^{-1}$)","interpreter","latex")
ylabel("$M_1$", "interpreter", "latex")
exportgraphics(gcf, "q1/q1a.png")
hold on

%% part b
x = 80;
%calculate mach no @ given mass flow rate
y = interp1(mdot, M_1, x);
%plot
plot(x, y, ".", "MarkerSize", 25, "Color", "#fda0cc")
offsetx = 5;
offsety = 0.01 * offsetx;
text(x - offsetx, y - offsety, sprintf("(%.1f, %.3f)", x, y))
exportgraphics(gcf, "q1/q1b.png")
%write value
file = fopen("q1/q1b_mach.tex", "w");
fwrite(file, sprintf("%.3f",y));
fclose(file);

%%part c
M1 = y;
P_1 = P_0 / ((1 + (((k - 1) / 2) .* (y .^ 2))) .^ (k / (k - 1))); %calc P1 from isentropic flow relations
Dadd = P_1 .* A_1 .* (1 + ((k) .* (M1.^2))) - (P_0 .* A_1); %calculate additive drag
file = fopen("q1/q1c_Dadd.tex", "w");
fwrite(file, sprintf("%.3f",Dadd));
fclose(file);
file = fopen("q1/q1c_P1.tex", "w");
fwrite(file, sprintf("%.3f",P_1));
fclose(file);
```

2. The loss in thrust due to the inlet is defined as $\phi_{inlet} = D_{inlet}/F$. For subsonic conditions, the additive drag is a conservative estimate of D_{inlet}

Along with isentropic flow relations, a clearly set out derivation, that for subsonic conditions, ϕ_{inlet} can be written / estimated as:

$$\phi_{inlet} = \frac{D_{add}}{F} = \frac{(M_0/M_1)\sqrt{T_1/T_0}(1+\gamma M_1^2) - (A_1/A_0 + \gamma M_0^2)}{(F/\dot{m}_0)(\gamma M_0/a_0)} \tag{7}$$

(a) Calculate and plot (using Matlab) the variation of ϕ_{inlet} with flight Mach number M_0 from 0.20 to 0.90 for inlet Mach numbers M_1 of 0.60 and 0.80 with $(F/\dot{m}_0)(\gamma M_0/a_0) = 4.5$. Explain the shapes / trends of the resulting graphs.

Given data:

$0.20 < M_0 < 0.90$ $M_1 = 0.60, 0.80$ $(F/\dot{m}_0)(\gamma M_0/a_0) = 4.5$

So (7) becomes:

$$\phi_{inlet} = \frac{D_{add}}{F} = \frac{(M_0/M_1)\sqrt{T_1/T_0}(1+\gamma M_1^2) - (A_1/A_0 + \gamma M_0^2)}{4.5} \tag{8}$$

Since $T_{t0} = T_{t1}$ and $\frac{T_t}{T} = 1 + \frac{\gamma-1}{2}M^2$:

$$T_1/T_0 = \left(\frac{\cancel{T_{t1}}}{1+\frac{\gamma-1}{2}M_1^2}\right) \times \left(\frac{1+\frac{\gamma-1}{2}M_0^2}{\cancel{T_{t0}}}\right)$$

$$\boxed{\Rightarrow \sqrt{\frac{T_1}{T_0}} = \left(\frac{1+\frac{\gamma-1}{2}M_0^2}{1+\frac{\gamma-1}{2}M_1^2}\right)^{\frac{1}{2}}} \tag{9}$$

Mass flow rate remains the same:

$$\begin{aligned}
\dot{m}_0 &= \dot{m}_1 \\
\rho_0 A_0 V_0 &= \rho_1 A_1 V_1 \\
\Rightarrow \frac{A_1}{A_0} &= \frac{\rho_0 V_0}{\rho_1 V_1}
\end{aligned}$$

Since $V = aM$, $P = \rho RT$, so $a^2 = \gamma RT = \gamma\frac{P}{\rho}$:

$$\begin{aligned}
\frac{V_0}{V_1} &= \frac{M_0\sqrt{\cancel{\gamma}\frac{P_0}{\rho_0}}}{M_1\sqrt{\cancel{\gamma}\frac{P_1}{\rho_1}}} \\
&= \frac{M_0}{M_1}\sqrt{\frac{P_0\rho_1}{P_1\rho_0}} \\
\Rightarrow \frac{A_1}{A_0} &= \frac{\rho_0}{\rho_1}\frac{M_0}{M_1}\sqrt{\frac{P_0\rho_1}{P_1\rho_0}} \\
&= \sqrt{\frac{\rho_0 P_0}{\rho_1 P_1}}\frac{M_0}{M_1} \\
&= \frac{P_0}{P_1}\sqrt{\frac{\cancel{R}T_1}{\cancel{R}T_0}}\frac{M_0}{M_1}
\end{aligned}$$

Using isentropic flow relations $\frac{P_0}{P_1} = \left(\frac{T_0}{T_1}\right)^{\frac{\gamma}{\gamma-1}} = \left(\frac{T_1}{T_0}\right)^{\frac{-\gamma}{\gamma-1}}$:

$$\frac{A_1}{A_0} = \left(\frac{T_1}{T_0}\right)^{\frac{-(\gamma+1)}{2(\gamma-1)}}\frac{M_0}{M_1} \tag{10}$$

$$\boxed{\frac{A_1}{A_0} = \frac{M_0}{M_1}\left(\frac{1+\frac{\gamma-1}{2}M_1^2}{1+\frac{\gamma-1}{2}M_0^2}\right)^{\frac{\gamma+1}{2(\gamma-1)}}} \tag{11}$$

Substituting (9) and (10) to (8) gives an expression for ϕ_{inlet} in terms of known values. See Matlab code at the end of Question 2 for calculation.

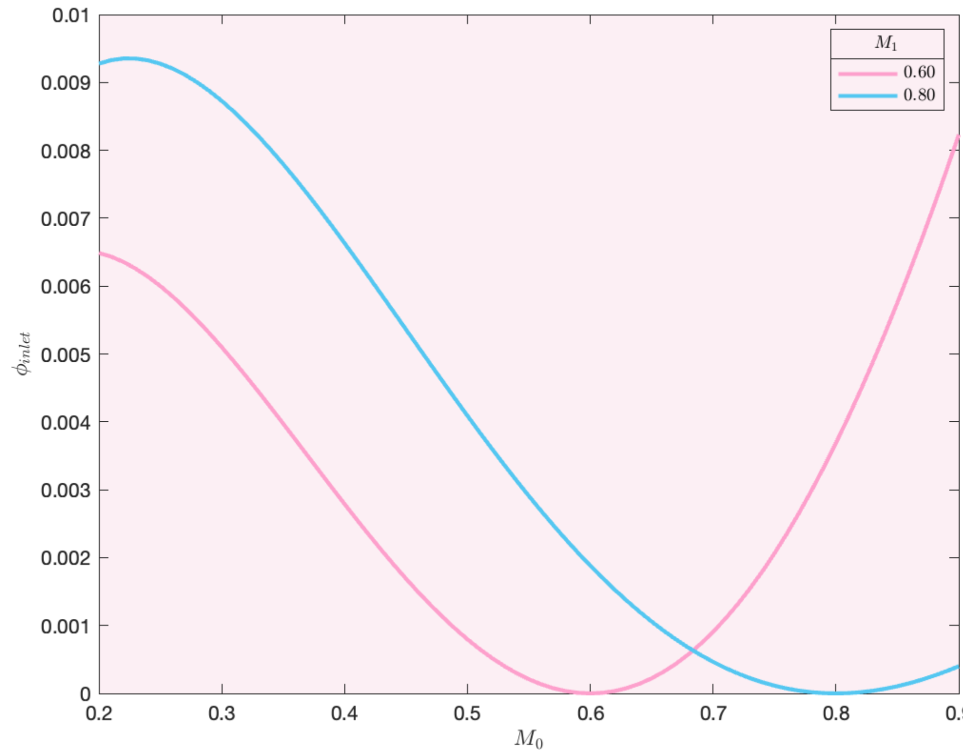

Figure 4: Loss in thrust due to inlet, ϕ_{inlet}, in $0.20 < M_0 < 0.90$ for M_1 values of 0.60 and 0.80.

As shown in Figure 4, the loss in thrust is quite high outside of the design inlet mach numbers. There are local minima at each design mach number for $D_{add} = 0$. The drag increases on either side of the local minima, with greater drag the further the mach number increases/decreases from the design mach number.

Matlab code

q2.m

```
clear;
clc;
clf;

%given data
M0 = 0.20:0.01:0.90; %initialise 0.20 < M_0 < 0.90 with step size of 0.01
M_1 = [0.60,  0.80];
k = 1.4;

i = 1;
colours = ["#fda0cc", "#54C7F1"];
for m1 = M_1
    %calculate parts of the expression - T1 / T0
    T1T0 = (1 + (k - 1)/2 * M0.^2) ./ (1 + (k - 1)/2 * m1^2);

    %use T1/T0 to obtain A1/A0
    A1A0 = (M0 ./ m1) .* (T1T0.^(-(k + 1) / (2 * (k - 1))));

    %sub all into eqn
    inlet_drag = (((M0./m1) .*  (sqrt(T1T0)) .* (1 + (k * (m1.^2)))) - (A1A0 + (k .* (M0.^2))))
    ↪  / 4.5;

    %plot
    plot(M0, inlet_drag, "DisplayName", sprintf("%.2f", m1), "Color", colours(i), "LineWidth",
    ↪  2)

    i = i + 1;
    hold on
end
```

```
leg = legend("color", "#fceff4", "location", "northeast");
leg.Title.String = "$M_1$";
set(leg, "interpreter", "latex")
set(gca,"Color","#fceff4")
xlabel("$M_0$","interpreter","latex")
ylabel("$\phi_{inlet}$", "interpreter", "latex")
exportgraphics(gcf, "q2/q2.png")
```

3. A turbofan engine with separate exhaust streams and a bypass ratio of 5.0 is designed to operate at Mach 0.80 at an altitude of 8.0 km (where ambient temperature is 236 K). The core of the engine produces one quarter of the total thrust of the engine. The speed of the gas leaving the core is twice the flight speed of the aircraft. Determine the speed with which the gas exits the bypass nozzle. Assume the nozzles expand both exhaust streams to ambient pressure and that the mass flow rate of fuel may be neglected. Assume also that the ratio of specific heats is $\gamma = 1.4$ and the gas constant is $R = 287$ Jkg^{-1}K^{-1}.

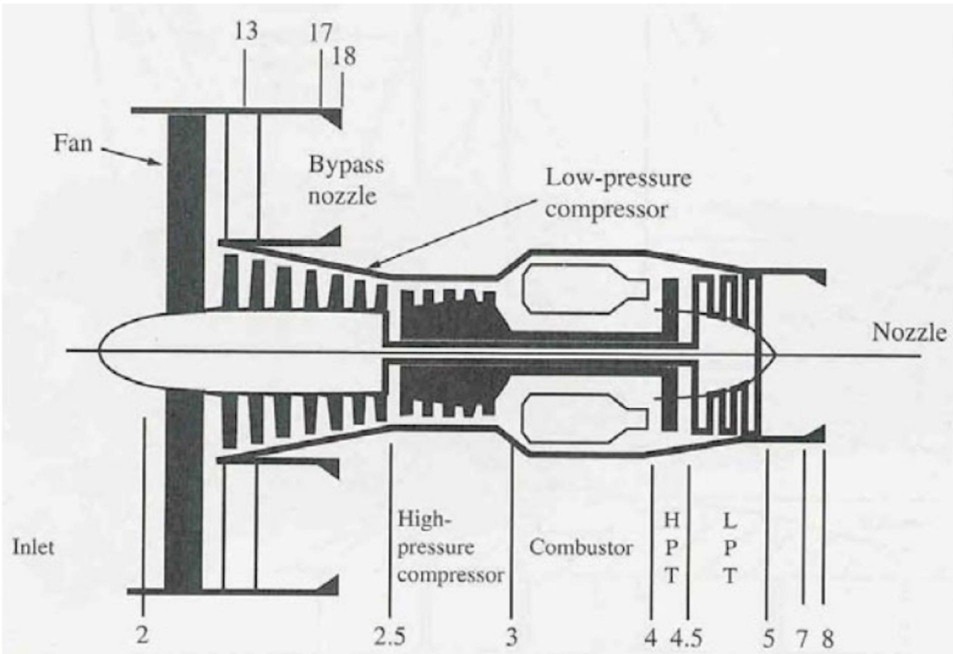

Figure 5: Turbofan diagram from lecture slides

Given data:

$\alpha = \frac{\dot{m}_f}{\dot{m}_c} = 5.0$

$M_0 = 0.80$

$h = 8$ km

$T_0 = 236$ K

$\gamma = 1.4$

$F_{total} = 4F_c$

$P_0 = P_9 = P_{19}$

$V_9 = 2V_0$

$R = 287$ Jkg^{-1}K^{-1}

$\dot{m}_f$ is negligible

Total thrust:

$$\begin{aligned} F_{total} &= F_c + F_f \\ &= \dot{m}_c(V_9 - V_0) + \dot{m}_F(V_{19} - V_0) \\ &= F_c + \dot{m}_f(V_{19} - V_0) \\ &= 4F_c \\ \Rightarrow 3F_c &= \dot{m}_f(V_{19} - V_0) \end{aligned}$$

So

$$\begin{aligned} 3\dot{m}_c(V_9 - V_0) &= \dot{m}_f(V_{19} - V_0) \\ 3(2V_0 - V_0) &= \frac{\dot{m}_f}{\dot{m}_c}(V_{19} - V_0) \\ 3V_0 &= \alpha(V_{19} - V_0) \end{aligned}$$

Rearranging for the speed at which the gas exits the bypass nozzle:

$$V_{19} = \frac{3V_0}{\alpha} + V_0 \tag{12}$$

The below Matlab code was used to substitute $V = aM = \sqrt{\gamma RT}M$, and known values into (12) to obtain

$$\boxed{V_{19} = 394.159 \text{ ms}^{-1}}$$

Matlab code

q3.m

```matlab
clear;
clc;

%given info
bypass_ratio = 5;
M0 = 0.8;
T0 = 236; %K
R = 287; %Jkg-1K-1
k = 1.4;


V0 = M0 * sqrt(k * R * T0);%calculate V0
result = (3 * V0 / bypass_ratio) + V0;%calculate V19

%write to document
file = fopen("q3/v19.tex", "w");
fwrite(file, sprintf("%.3f",result));
fclose(file);
```

4. Determine the optimum compressor pressure ratio and specific thrust of an ideal turbojet engine giving the maximum specific thrust at the following conditions: flight Mach number of 2.5, static freestream temperature of 220 K, total temperature at the burner exit of 1600 K, fuel heating value of $h_{PR} = 42800$ kJkg^{-1}, constant pressure specific heat of $c_p = 1004$ Jkg^{-1}K^{-1}, and specific heat ratio of $\gamma = 1.4$

Given data:

$M_0 = 2.5$

$T_0 = 220$ K

$T_{t4} = 1600$ K

$h_{PR} = 42800 \text{ kJkg}^{-1} = 4.28 \times 10^7 \text{ Jkg}^{-1}$

$c_p = 1004 \text{ Jkg}^{-1}\text{K}^{-1}$

$\gamma = 1.4$

Refer to turbojet diagram in Figure 1. It is known that at optimum operating conditions, compressor ratio π_c can be given by:

$$\pi_c = \tau_c^{\frac{\gamma}{\gamma-1}} = \left(\frac{\sqrt{\tau_\lambda}}{\tau_r}\right)^{\frac{\gamma}{\gamma-1}} \tag{13}$$

It is known that temperature ratios:

$$\begin{aligned} \tau_\lambda &= \frac{T_{t4}}{T_0} = \tau_r\tau_b\tau_c \\ &= 7.273 \\ \tau_r &= 1 + \frac{\gamma-1}{2}M_0^2 \\ &= 2.250 \end{aligned} \tag{14}$$

By substituting known values into (14) and (13):

$$\pi_c = \left(\frac{\sqrt{T_{t4}/T_0}}{1 + \frac{\gamma-1}{2} M_0^2} \right)^{\frac{\gamma}{\gamma-1}}$$

$$= 1.885$$

So from (13):

$$\begin{aligned} \tau_c &= {\pi_c}^{\frac{\gamma-1}{\gamma}} \\ &= 1.199 \end{aligned} \tag{15}$$

The ideal specific thrust, $\frac{F}{\dot{m}_0}$, is given by:

$$\frac{F}{\dot{m}_0} = a_0 \left(\sqrt{\frac{2}{\gamma - 1} \frac{\tau_\lambda}{\tau_r \tau_c} (\tau_r \tau_c \tau_t - 1)} - M_0 \right) \tag{16}$$

Where

$$\begin{aligned} a_0 &= \sqrt{\gamma R T_0} \\ &= \sqrt{\cancel{\gamma} c_p \frac{\gamma - 1}{\cancel{\gamma}} T_0} \\ &= \sqrt{c_p (\gamma - 1) T_0} \\ &= 297.241 \text{ ms}^{-1} \end{aligned} \tag{17}$$

It is also known that

$$\begin{aligned} \tau_t &= 1 - \frac{\tau_r}{\tau_\lambda} (\tau_c - 1) \\ &= 0.939 \end{aligned} \tag{18}$$

By substituting (14), (15), (17), and (18) into (16):

$$\frac{F}{\dot{m}_0} = 607.485 \text{ Nskg}^{-1}$$

Matlab code

q4.m

```
clear;
clc;

% known data
M0 = 2.5;
T0 = 220; %K
Tt4 = 1600; %K
hpr = 4.28e7; %Jkg-1
cp = 1004; %Jkj-1K-1
k = 1.4;

%calc temp ratios
tau_lambda = Tt4 / T0;
tau_r = 1 + (((k - 1) / 2) * (M0 ^2));
tau_c = sqrt(tau_lambda) / tau_r;

%calc pressure ratio
pi_c = tau_c^(k / (k - 1));

%calc tau_t
tau_t = 1 - ((tau_r / tau_lambda) * (tau_c - 1));

%calculate a0
a0 = sqrt(cp * (k - 1) * T0);

%calculate specific thrust
```

```
specific_thrust = a0 * (sqrt((2 / (k - 1)) * (tau_lambda / (tau_r * tau_c)) * ((tau_r * tau_c *
↪  tau_t) - 1)) - M0);

%write to document
values = [pi_c, tau_lambda, tau_r, tau_c, tau_t, a0, specific_thrust];
labels = ["pi_c", "tau_lambda", "tau_r", "tau_c", "tau_t", "a0", "specific_thrust"];
i = 1;
for x = values
    filename = sprintf("q4/%s.tex", labels(i));
    file = fopen(filename, "w");
    fwrite(file, sprintf("%.3f",x));
    fclose(file);
    i = i + 1;
end
```

Outlook

Re: Propulsion assignment 1

From Rey Chin <rey.chin@adelaide.edu.au>
Date Sat 5/04/2025 9:43 PM
To Mei He (Student) <mei.he@student.adelaide.edu.au>

Dear Mei,

Please submit this email as proof of approval of extension, along with your access plan as pdf attachments with your assignment.

Cheers,
Rey.

From: Mei He (Student) <mei.he@student.adelaide.edu.au>
Date: Saturday, 5 April 2025 at 9:31 pm
To: Rey Chin <rey.chin@adelaide.edu.au>
Subject: Propulsion assignment 1

Hi Rey,

My name is Mei (a1900510) and I am enrolled in your course Aerospace Propulsion.

My Assignment 1 is due on Sunday 06/04/25 at 23:59. Please can I have an extension on this assignment and submit it by Friday 11/04/25 at 23:59.

Attached is a copy of my Access Plan.

Thanks,

Mei

Disability Support: ACCESS PLAN

Date:	25.1.2024
Student Name:	Mei He
Student ID:	1900510
Program:	Bachelor of Engineering (Honours) and Honours Degree of Bachelor of Science
Duration:	**Category A** - This Access Plan is applicable for the duration of the student's enrolment in the above Program. Any change of Program will require a new Access Plan.
Expiry Date:	**At the completion of the current Program.**
Disability Advisor:	**Annie Harris** **Email:** annie.harris@adelaide.edu.au **Phone:** 8313 5962

This Access Plan has been developed in consultation with the above student, in accordance with the Disability Discrimination Act 1992, the Disability Standards for Education 2005 and The University of Adelaide Reasonable Adjustments to Teaching and Assessment for Students with a Disability Policy. The student's disability/condition has been verified by supporting documentation.

This Access Plan provides general guidelines to assist the Course Coordinator and student to apply specific reasonable adjustments to their course. University staff are encouraged to contact the Disability Advisor if they require any assistance or have any questions related to implementing the verified recommendations below. Please refer to the Disability Support website for additional information regarding Reasonable Adjustments.

Note: Student responsibilities are outlined on the following page.

Course Coordinator

The Course Coordinator is required to incorporate the following Reasonable Adjustments into the student's study program, whilst maintaining the academic integrity of the assessment. The student must contact you to negotiate what is possible in the context of the course.

- **Extensions for assessable work (excluding quizzes/tests/exams):** The student may request extensions for assignments, of up to 5 calendar days, using their Access Plan. The student must contact the Course Coordinator before the due date to negotiate a new due date within existing course timelines. Granting of an extension may depend on the assessment format and frequency (e.g. excluding group work assignments). The student must contact the Course Coordinator at least one business day before the assessment due date, to allow the Course Coordinator reasonable time to respond.

- **Practical and laboratory participation:** The student may need to take short breaks outside of the lab. They will return to class as soon as possible. The student must discuss their specific requirements with their Demonstrator at the commencement of the Semester / Study Period.

- **Alternative Exam Arrangements (AEA) for in-department quizzes/tests/exams:** The student must contact the Course Coordinator at least 2 weeks prior to the quiz/test/exam for the following provisions to be provided:

  - 20 minutes extra time per hour in quizzes/tests/exams
  - Small group (10 seats maximum)
  - Student will bring medicine to their exams
  - Rest breaks can be taken in the corridor within the allocated time provided.

  Please note: An Access Plan cannot be used to apply for a replacement (rescheduled) in-department quiz/test/exam- refer to the MACA policy for further information.

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Student Responsibilities

- **Extensions for assessable work (excluding quizzes/tests/exams):** I must apply for extensions before the due date, to negotiate an alternative submission date within existing course timelines. I understand that a standard extension with an Access Plan can be up to 5 calendar days, however this may not be possible within all courses or for all assessment formats (e.g. group work assignments, weekly assessments). It is my responsibility to contact the Course Coordinator at least one business day before the assessment due date, to allow the Course Coordinator reasonable time to respond.
- If I need to apply for a longer extension, further documentation may be required.
  If I need to apply for an extension relating to a health issue that is not included in the medical documentation already provided to Disability Support, I will need to follow the Modified Arrangements for Coursework Assessment (MACA) guidelines.

- **Practical and laboratory participation:** If I am unable to attend a practical/ laboratory session, I must notify my Demonstrator on the same day, to discuss possible alternative attendance later in the week.

- **In-department quiz/test/exam- Alternative Exam Arrangements (AEA):** ~~I~~ must contact my Course Coordinator and provide them with a copy of my Access Plan at least 2 weeks before each in-department quiz/test/exam and specifically ask them to arrange my AEA.

  I understand that my Access Plan cannot be used to apply for a replacement (rescheduled) in-department quiz/test/exam.

Other responsibilities

I must provide a copy of my Access Plan to each of my Course Coordinators (and other relevant teaching staff) within the first week of the semester / teaching period, or within 5 working days of receipt of my Access Plan.

I must regularly check my student email and ensure my contact details are up to date on MyAdelaide.
I must notify my Disability Advisor to review my Access Plan and AEA if:
- I change my Program, including undertaking Honours or Post Graduate studies
- my medical condition or health requirements change
- I take a break from my studies of more than one year.

An updated Verification and Impact Statement (VIS) is not required unless the student's medical condition or requirements change.

This Access Plan has been prepared and agreed to following discussion with the above-named student.

Disability Advisor signature: AHon Date: 25.1.2024