UNIT NINE: ADDITIONAL EXERCISES

This unit contains spirograms and test results from several individuals to give you additional opportunities to practice calculation skills. Answers are given for most of the questions.

EXERCISE 1.

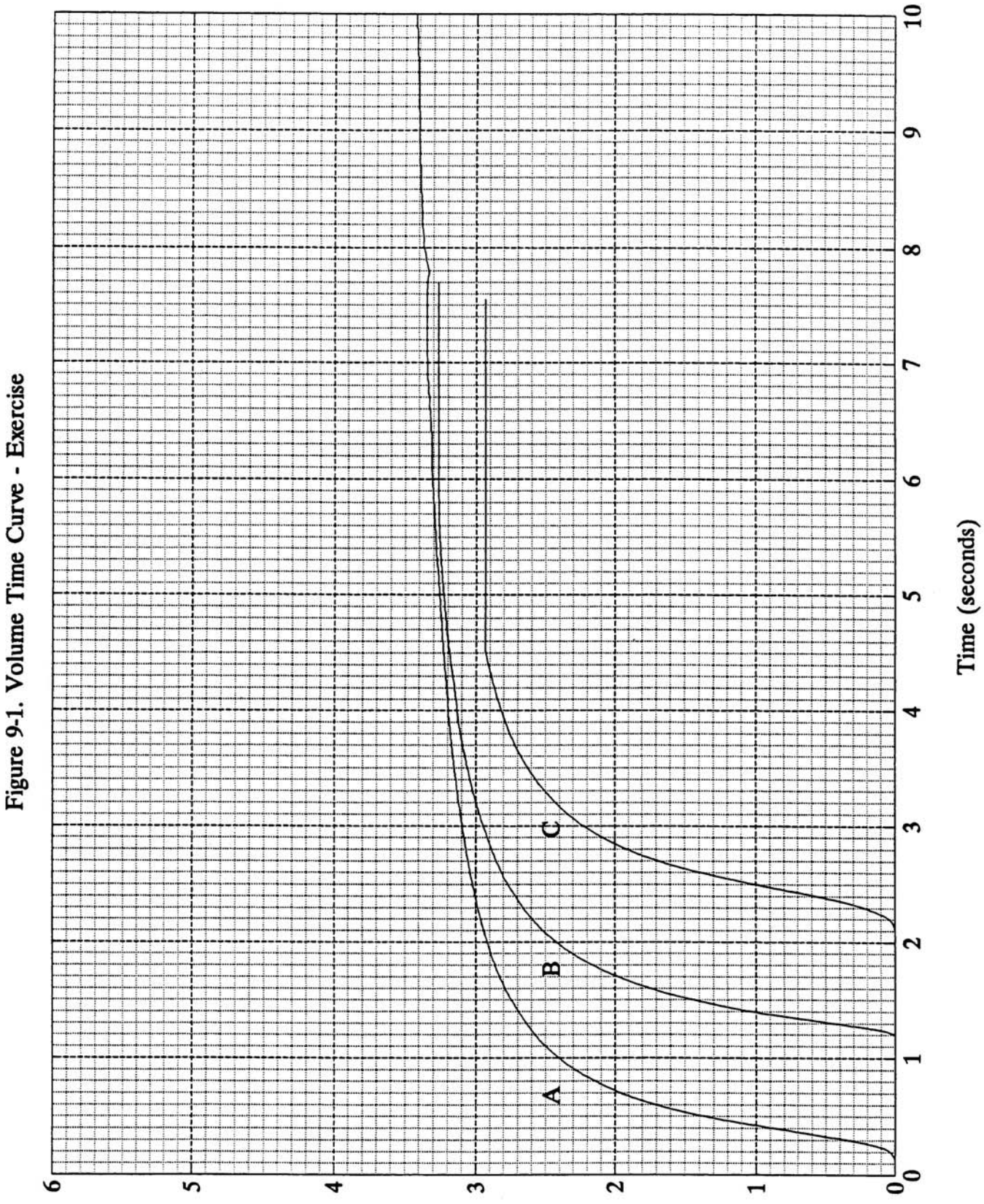
(Refer to Figure 9-1. Volume Time Curve - Exercise.)

a. Do these curves meet acceptability criteria?

FEEDBACK:

a. No. Curve C shows a glottis closure. Curve A is a judgment call on whether or not a plateau was reached.

FIGURE 9-1. VOLUME TIME CURVE – EXERCISE



EXERCISE 2.

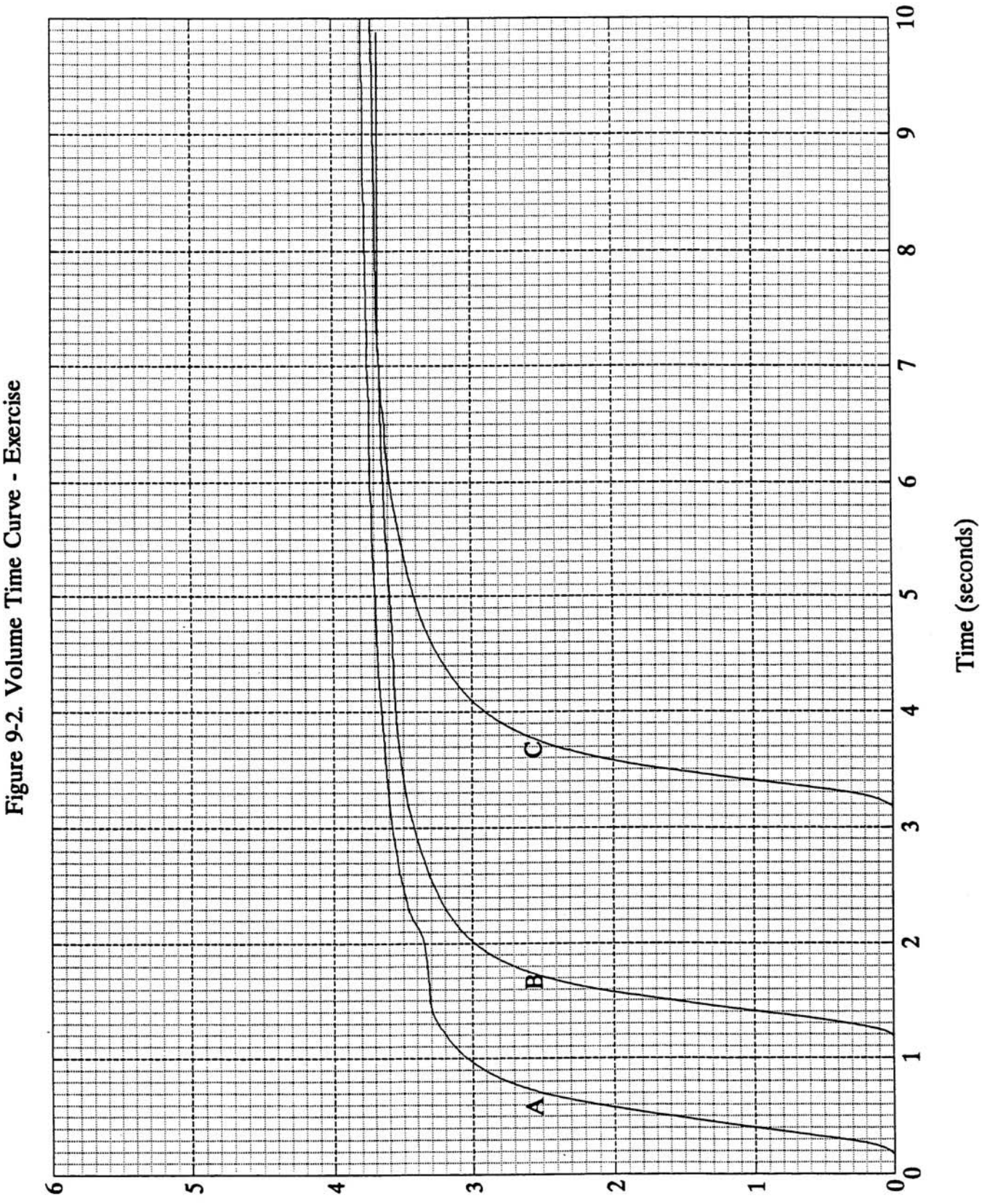
(Refer to Figure 9-2. Volume Time Curve - Exercise.)

a. Do these curves meet acceptability criteria?

FEEDBACK:

a. No. Curve A shows a cough or variable effort early in the maneuver.

FIGURE 9-2. VOLUME TIME CURVE – EXERCISE



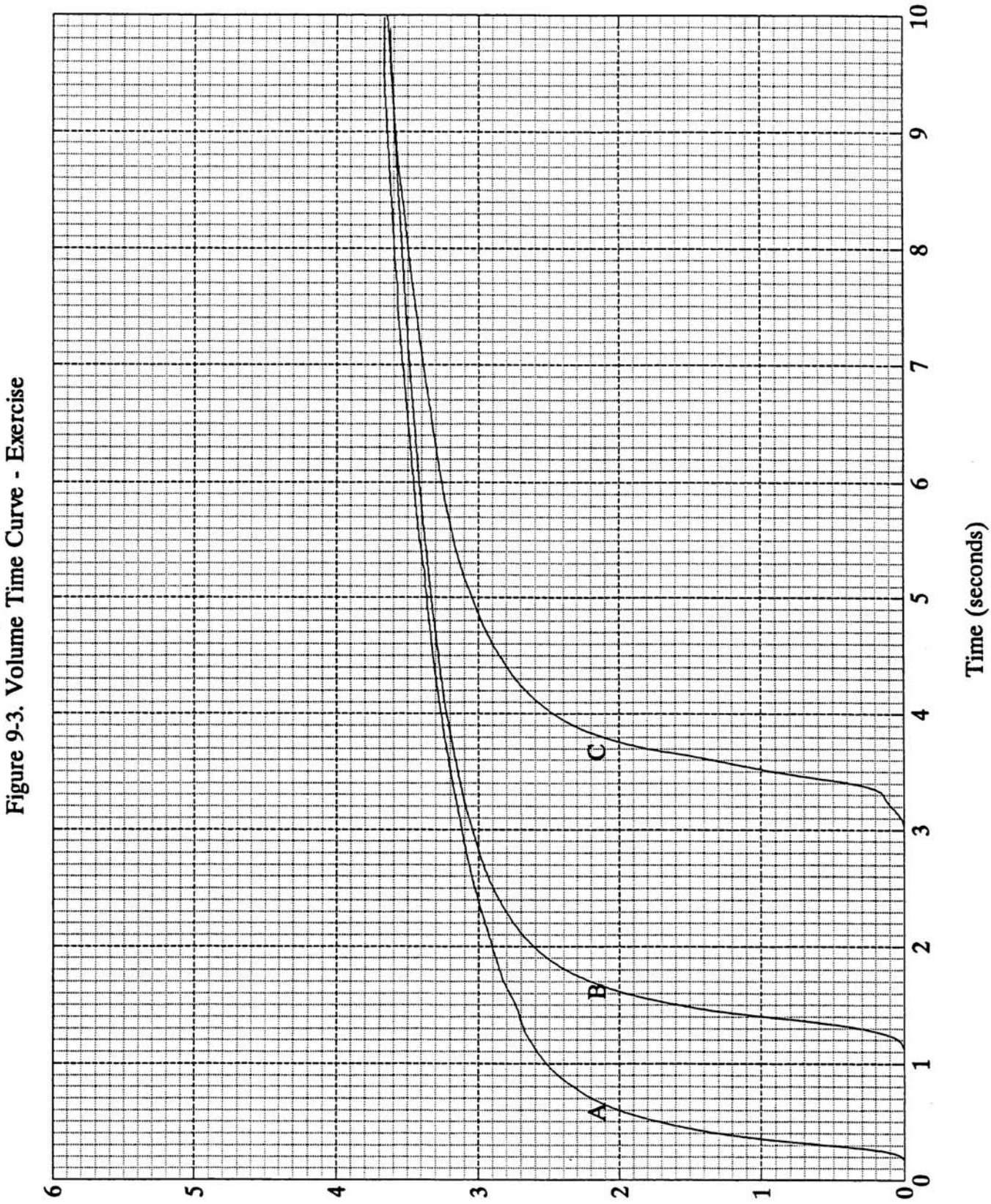
EXERCISE 3.
(Refer to Figure 9-3. Volume Time Curve Exercises.)

a. Do these curves meet acceptability criteria?

FEEDBACK:

a. No. All curves show a failure to plateau. Curve C also had some extrapolated volume but would have been acceptable (4.4%) if a plateau had been reached.

FIGURE 9-3. VOLUME TIME CURVE – EXERCISE



EXERCISE 4.

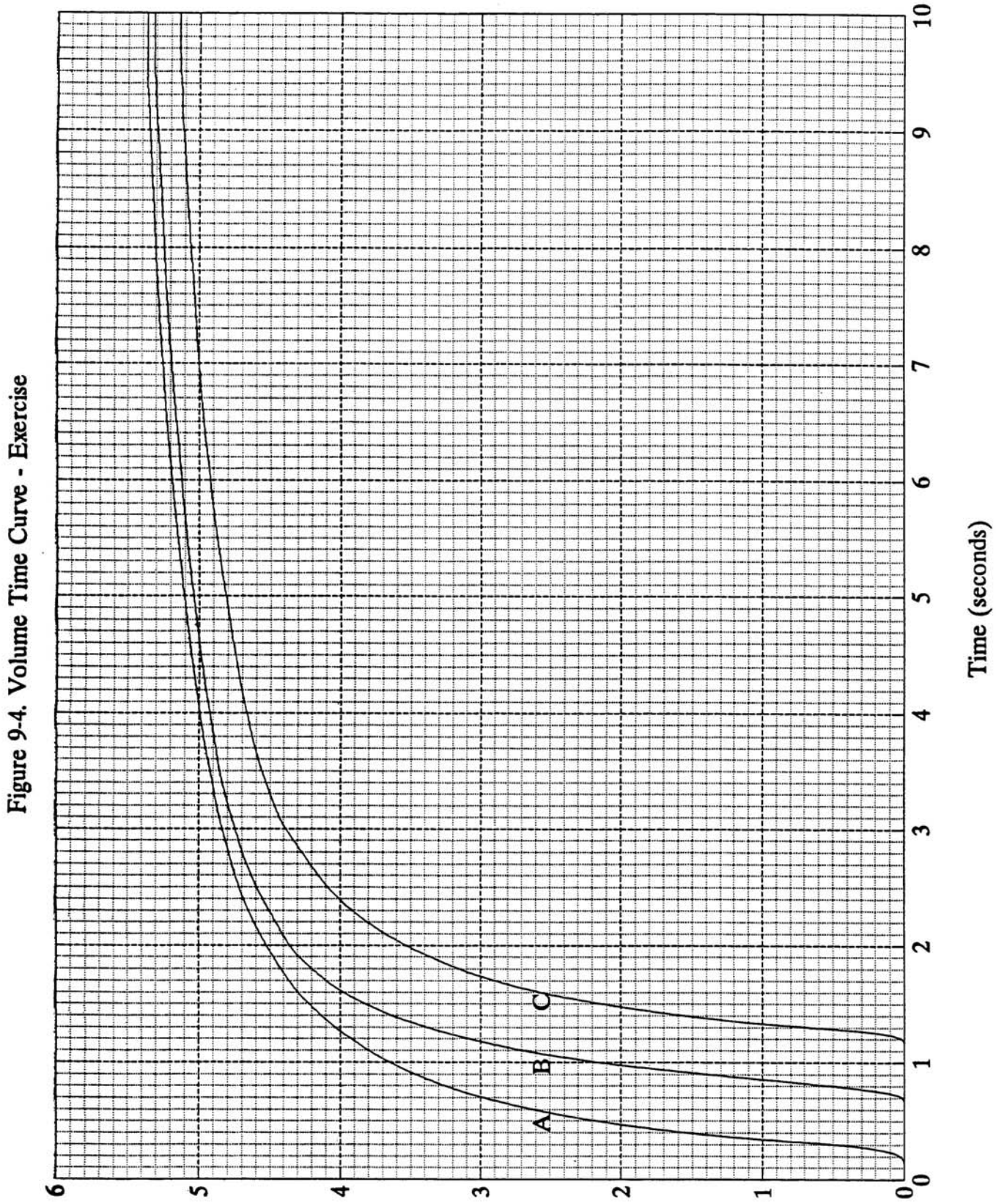
(Refer to Figure 9-4. Volume Time Curve - Exercise.)

a. Do these curves meet acceptability criteria?

FEEDBACK:

a. Yes. However, the plateau is short and it would be a good idea to have the individual blow slightly longer (another half-second) to be sure a plateau has been obtained.

FIGURE 9-4. VOLUME TIME CURVE - EXERCISE.



EXERCISE 5.

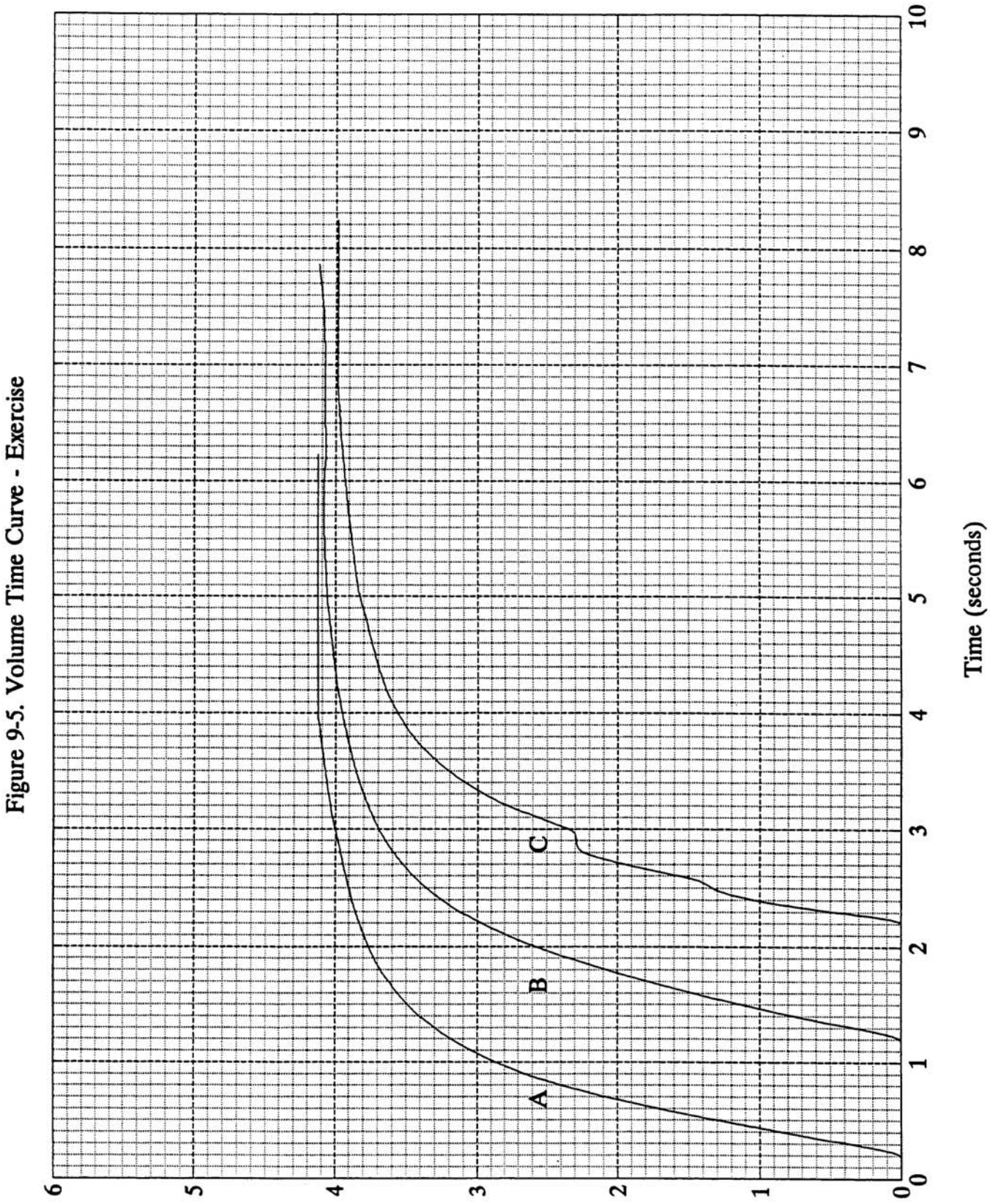
(Refer to Figure 9-5. Volume Time Curve - Exercises.)

a. Do these curves meet acceptability criteria?

FEEDBACK:

a. No. Curve C shows a cough or variable effort early in the maneuver.

FIGURE 9-5. VOLUME TIME CURVE – EXERCISE



EXERCISE 6.

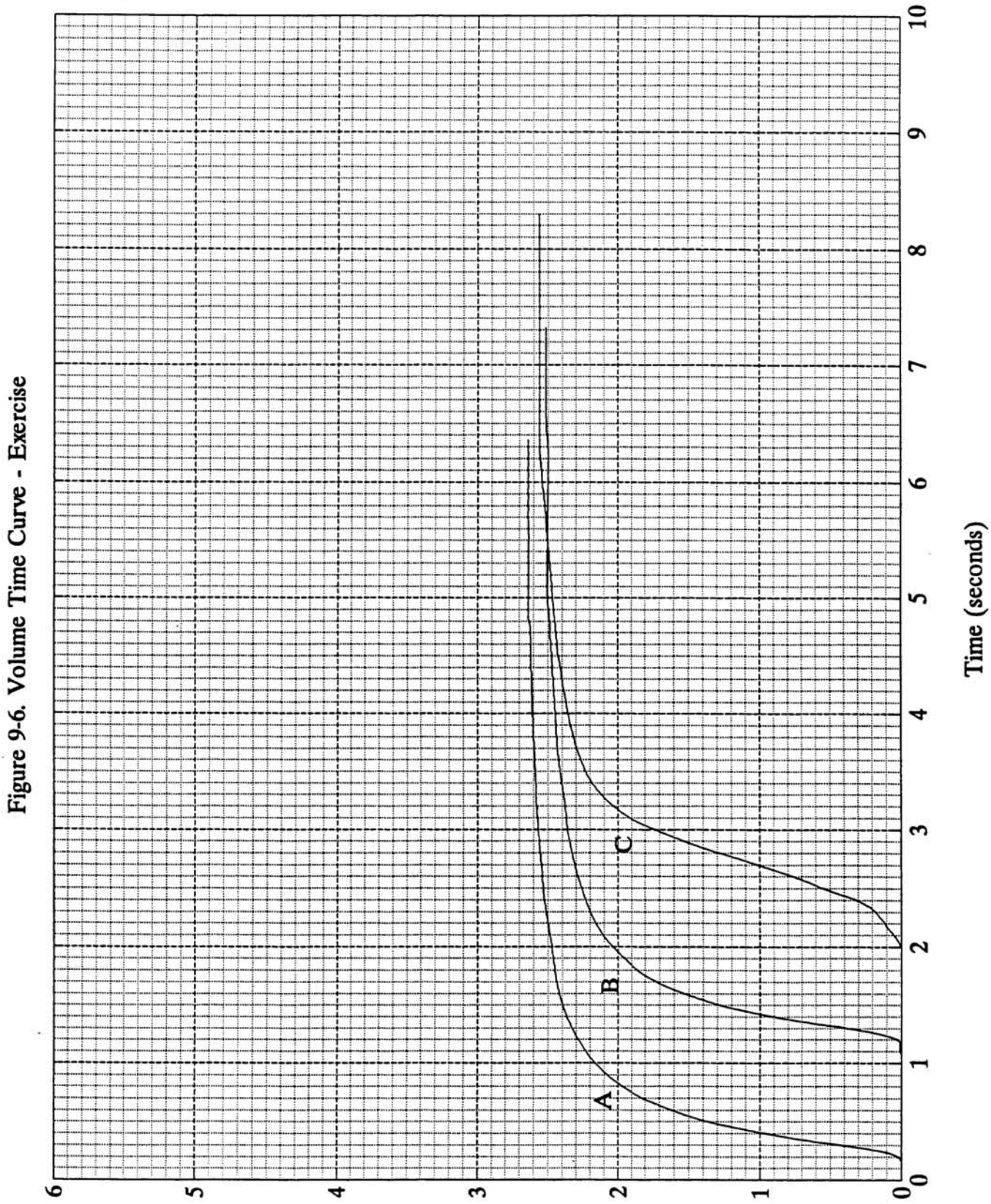
(Refer to Figure 9-6. Volume Time Curve - Exercises.)

a. Do these curves meet acceptability criteria?

FEEDBACK:

a. No. Curve C shows excessive extrapolated volume (approximately 7.03%).

FIGURE 9-6. VOLUME TIME CURVE - EXERCISE.



EXERCISE 7.

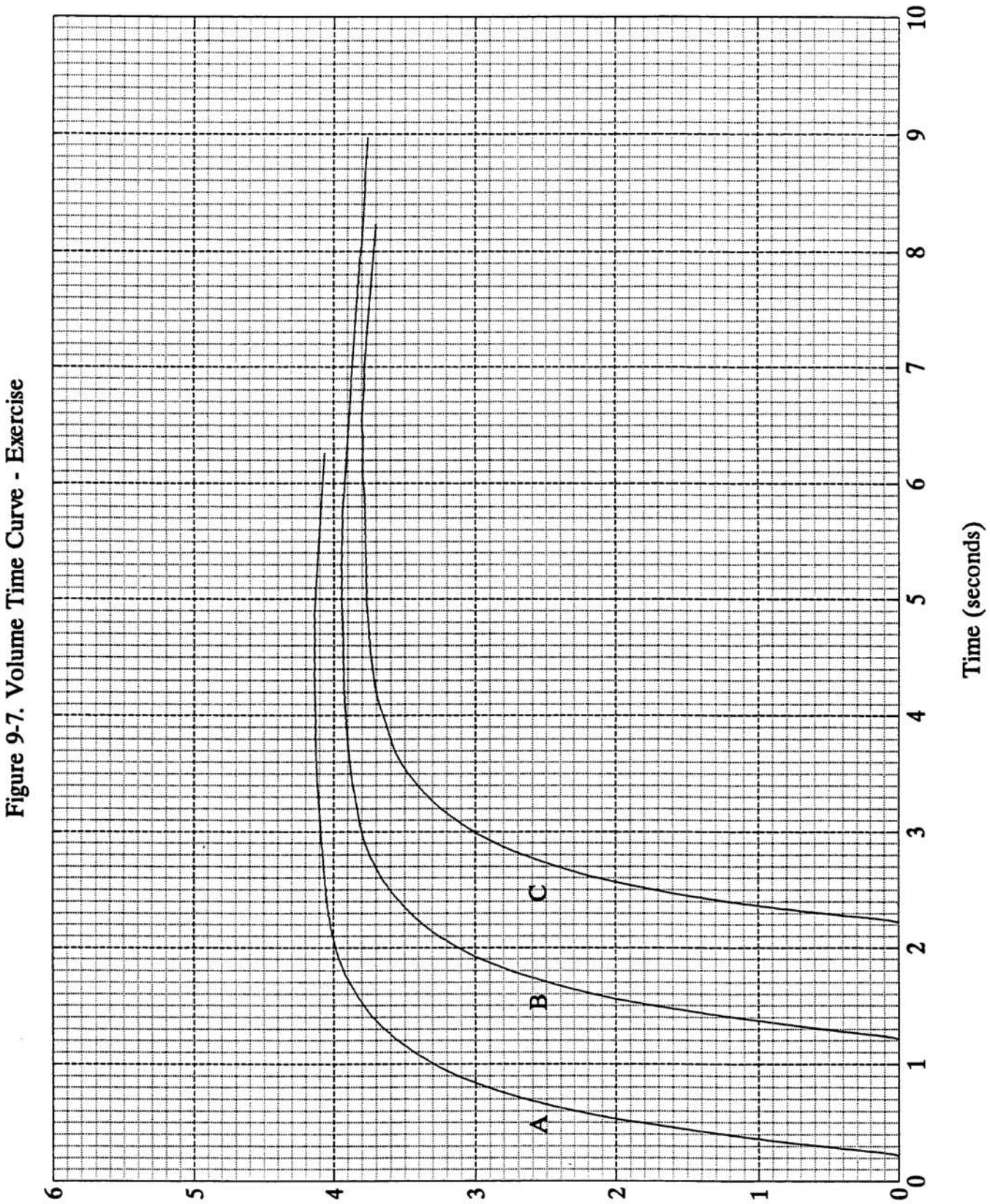
(Refer to Figure 9-7. Volume Time Curve - Exercises.)

a. Do these curves meet acceptability criteria?

FEEDBACK:

a. No. All three indicate leakage.

FIGURE 9-7. VOLUME TIME CURVE - EXERCISE.



EXERCISE 8.

(Refer to Figure 9-8. Volume Time Curve - Exercises.)

a. Do these curves meet acceptability criteria?

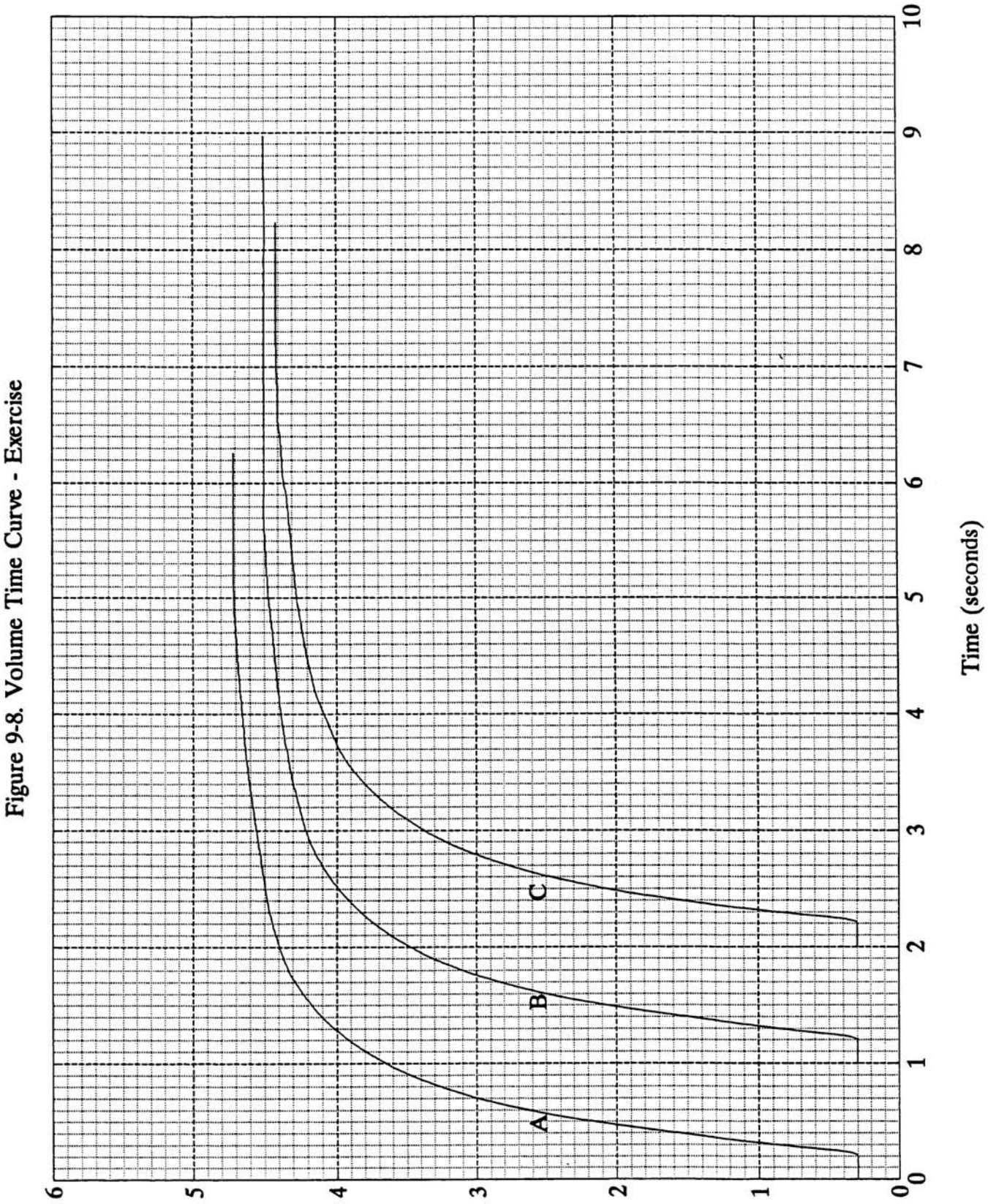
b. If not, what could be done to make them acceptable?

FEEDBACK:

a. No. All three show the same baseline error.

b. Subtract 0.3 liters from the FEV_1 and FVC results to correct for the error in this example.

FIGURE 9-8. VOLUME TIME CURVE - EXERCISE.



EXERCISE 9.

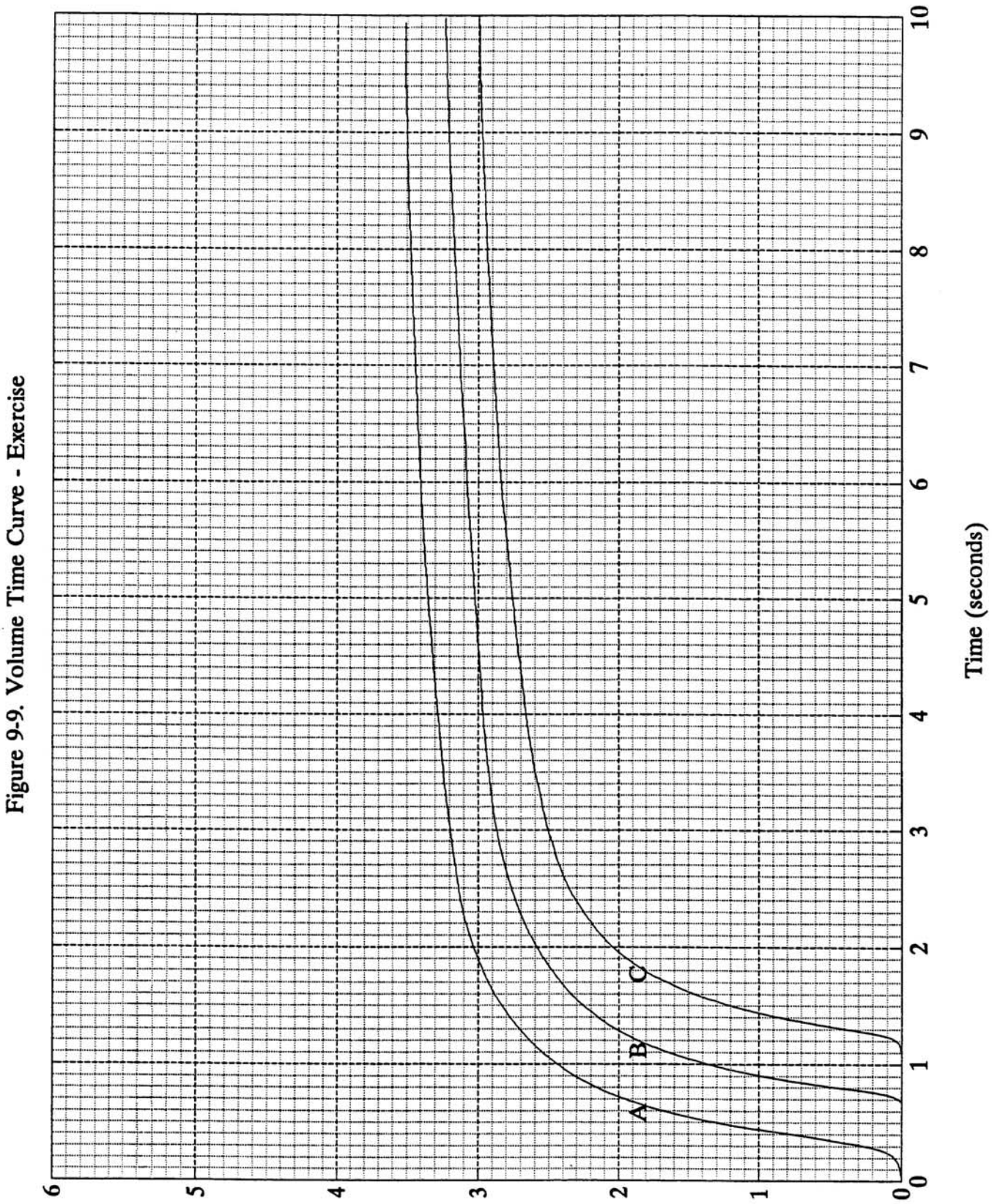
(Refer to Figure 9-9. Volume Time Curve - Exercise.)

a. Do these curves meet acceptability criteria?

FEEDBACK:

a. No. Curves B and C did not reach a plateau. Curve A had some extrapolated volume, but would have been acceptable. (FVC A = 3.5 L, extrapolated volume = 0.15 L or 4.3% of the FVC). Coach **Blast the Air Out at first** and blow out longer.

FIGURE 9-9. VOLUME TIME CURVE - EXERCISE.



EXERCISE 10.

Refer to Figure 9-10. Volume Time Curve - Exercise.

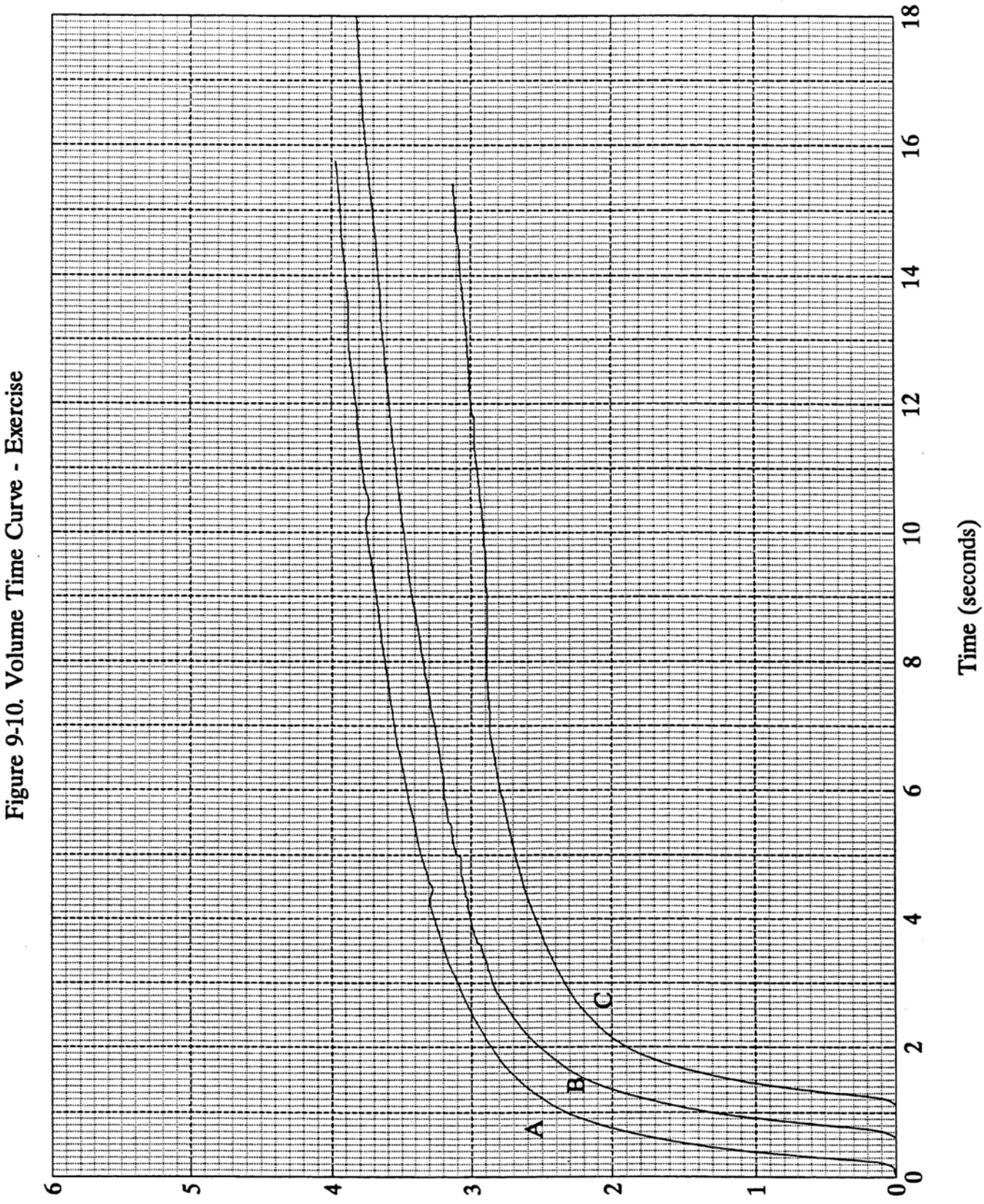
The paper size does not conform to ATS standards for hand calculations due to reproduction constraints. This exercise was included to show curves that are longer than 10 seconds in duration.

a. Do these curves meet acceptability criteria?

FEEDBACK:

a. No. None reached a plateau. However, this individual shows an obstructive pattern and may not be able to produce reproducible tracings with plateaus. The technician may want to discuss these results with the interpreting physician before determining whether to obtain additional tracings. Although all of the curves show coughs or variable efforts, they occurred late in the maneuver and were insignificant in size.

FIGURE 9-10. VOLUME TIME CURVE - EXERCISE.



EXERCISE 11.

(Refer to Figure 9-11. Volume Time Curve - Exercises.)

a. Do these curves meet acceptability criteria?

b. Do at least two of the three curves meet FVC and FEV_1 reproducibility criteria?

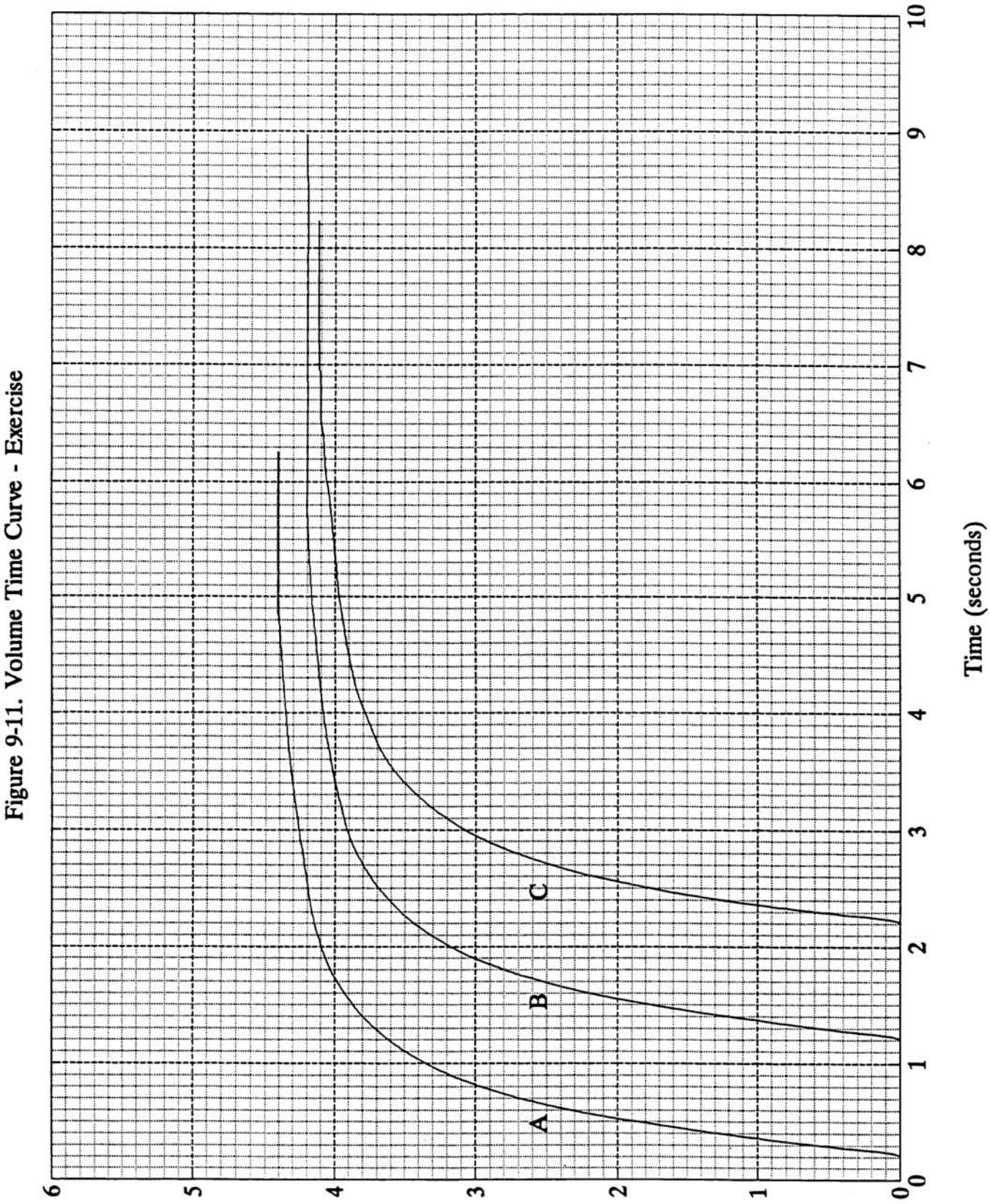
FEEDBACK:

a. Yes. Acceptability criteria are met.

b. FVC reproducibility criteria are met (190 ml difference; **optional** 4.3%).
FEV_1 reproducibility criteria are met (190 difference; **optional** 5.2% does not meet ATS-87). There are variable volumes; so, coach **Take a Deeper Breath In**.

Curve A: FVC = 4.40 L FEV_1 = 3.64 L
Curve B: FVC = 4.21 L FEV_1 = 3.45 L
Curve C: FVC = 4.12 L FEV_1 = 3.34 L

FIGURE 9-11. VOLUME TIME CURVE - EXERCISE.



EXERCISE 12.

(Refer to Figure 9-12. Volume Time Curve - Exercises.)

a. Do these curves meet acceptability criteria?

b. Do at least two of the three curves meet FVC and FEV_1 reproducibility criteria?

FEEDBACK:

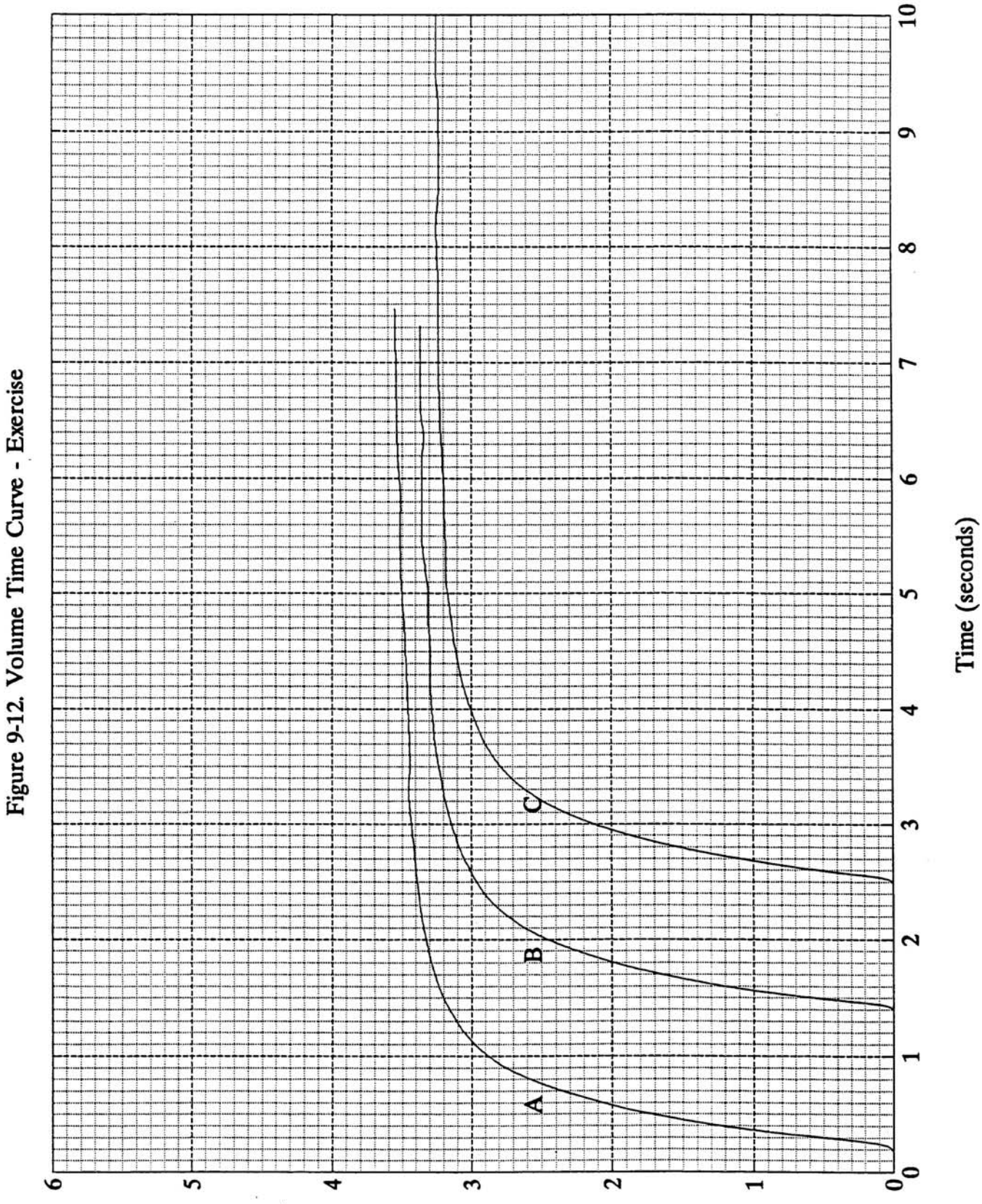
a. Yes. The curves meet acceptability criteria.

b. FVC variability = 180 ml (5.1%)
FEV_1 variability = 150 ml (4.9%)

The FVC is slightly below the ATS-1995 reproducibility criteria, and it is slightly beyond the ATS-1987 5% cut off. The technician may want to obtain further tests, depending on whether the subject feels he/she can continue. There are variable volumes, so coach **Take a Deeper Breath In**.

Curve A: FVC = 3.55 L FEV_1 = 3.07 L
Curve B: FVC = 3.37 L FEV_1 = 2.92 L
Curve C: FVC = 3.26 L FEV_1 = 2.80 L

FIGURE 9-12. VOLUME TIME CURVE - EXERCISE.



EXERCISE 13.

(Refer to Figure 9-13. Volume Time Curve - Exercise.)

Curve A is the largest of three acceptable tracings.

a. Calculate the FVC.

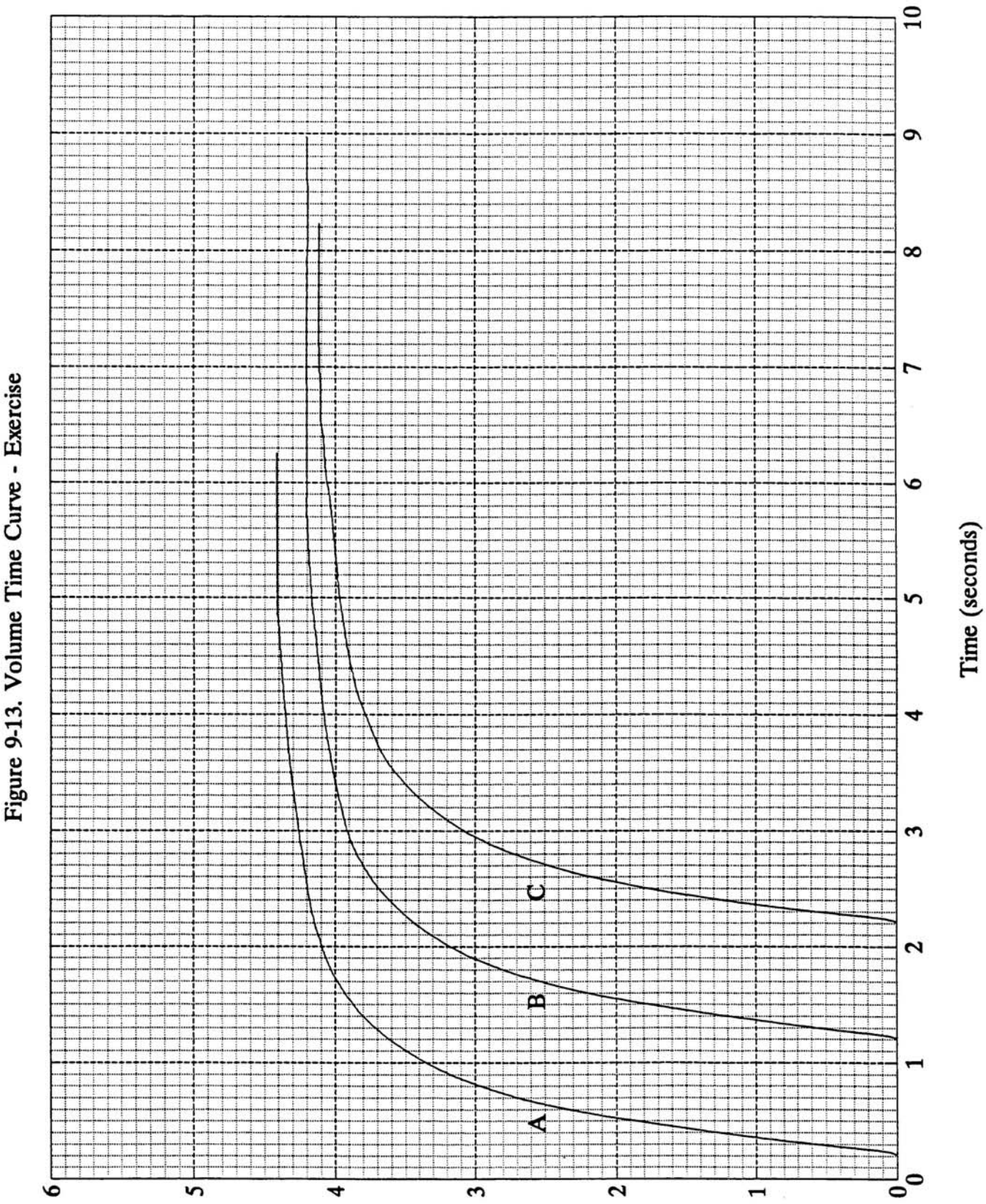
b. Calculate the FEV_1.

FEEDBACK:

a. FVC = 4.40 L.

b. FEV_1 = 3.65 L.

FIGURE 9-13. VOLUME TIME CURVE – EXERCISE.



EXERCISE 14.

(Refer to Figure 9-14, page 9-33. Volume Time Curve - Exercise.)

a. Determine the FVC for each curve:

Curve A _____

Curve B _____

Curve C _____

b. Is there excessive variability between the two largest FVCs?

c. What is the best FVC (ATPS) _____ ? What is the best FVC (BTPS) (ambient temperature = 24°C) ____ ?

FEEDBACK:

a. FVC (ATPS):

Curve A = 3.06 L.

Curve B = 2.97 L.

Curve C = 2.89 L.

b. No excessive variability, 90 ml or **optional** 2.94%.

c. Best FVC (ATPS) = 3.06 L.;
Best FVC (BTPS) = 3.30 L.

EXERCISE 14. CONTINUED:

d. Calculate the FEV_1 (ATPS) for each curve:

Curve A _____

Curve B _____

Curve C _____

e. Is there excessive variability between the two largest FEV_1s?

f. What is the best FEV_1 (ATPS)? What is the best FEV_1 (BTPS) _____ (ambient temperature = 24°C)?

g. Do all three tracings meet acceptability criteria?

h. Do at least two of the three tracings meet reproducibility criteria?

FEEDBACK:

d. FEV_1 (ATPS): Did you remember to use back extrapolation?

Curve A = 2.71 L.

Curve B = 2.79 L.

Curve C = 2.78 L.

e. No excessive variability, 10 ml (0.36%).

f. FEV_1 (BTPS) = 3.01 L.

g. All three meet acceptability criteria.

h. The two largest FVCs and FEV_1s meet reproducibility criteria.

EXERCISE 14. CONTINUED:

i. Calculate the FEV_1/FVC% _____

j. Calculate the $FEF_{25-75\%}$ (BTPS) _____

FEEDBACK:

i. FEV_1/FVC% = 91.2% Did you remember to use the best FEV_1 and the best FVC, even if they didn't come from the same curve?

j. $FEF_{25-75\%}$ = 3.10 liters/sec (BTPS). Did you remember to convert to BTPS?

Sum of the best curve: 5.77 (Curve A)

25% of the FVC = 0.77 L.

75% of the FVC = 2.30 L.

EXERCISE 14. CONTINUED:

k. If these curves were from a 30-year-old Caucasian female, 63 inches tall, what would her predicted values be using Appendix L.?

FVC pred. _____ FEV_1 pred. _____

l. What percent of the predicted values are the following for the above individual?

% FVC pred. _____ % FEV_1 pred. _____

m. If these curves were from a 30-year-old African American female, 67 inches tall, what would her predicted values be using Appendix L?

FVC pred. _____ FEV_1 pred. _____

n. What percent of the predicted are the following for the above individual?

% FVC pred. _____ % FEV_1 pred. _____

FEEDBACK:

K FVC pred. = 3.65 L. FEV_1 pred. = 2.09 L. Note: 63 inches is about 160 cm.

l. % FVC pred. = 90.4% % FEV_1 pred = 97.4%

m. FVC pred. = 3.55 L. FEV_1 pred. = 3.01 L. Note: 67 inches is about 170 cm.
Did you remember to use the race correction?

n. % FVC pred. = 93.0% % FEV_1 pred. = 100.0%

EXERCISE 14. CONTINUED:

o. If these curves were from a 30-year-old Caucasian male, 67 inches tall, what would his predicted values be using Appendix L?

FVC pred. _____ FEV_1 pred. _____

p. What percent of the predicted values are the following for the above individual?

% FVC pred. _____ % FEV_1 pred._____

q. If these curves were from a 30-year-old African-American male, 67 inches tall, what would his predicted values be using Appendix L?

FVC pred. _____ FEV_1 pred. _____

r. What percent of the predicted values are the following for the above individual?

% FVC pred. _____ % FEV_1 pred. _____

FEEDBACK:

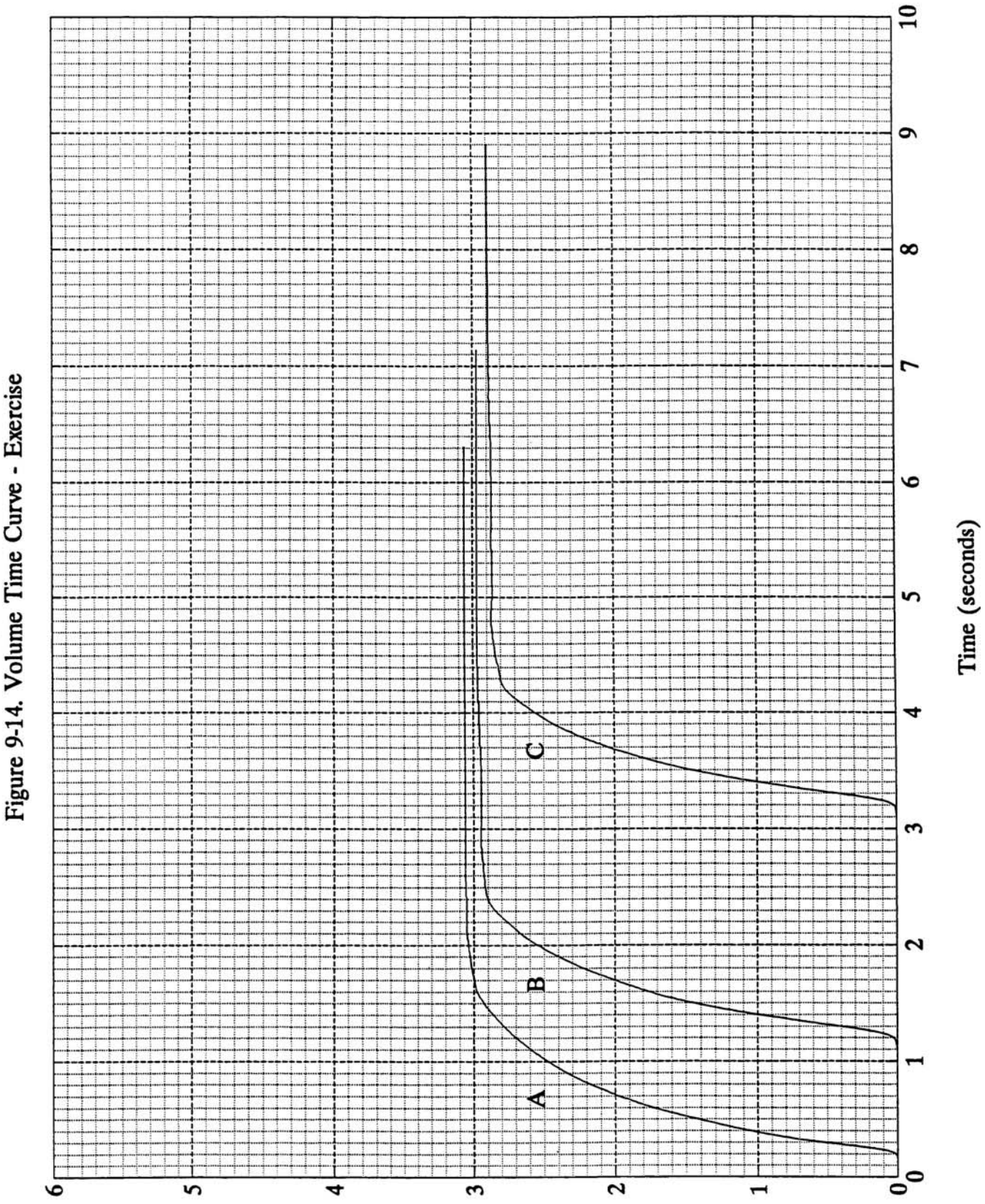
o. FVC pred. = 4.97 L. FEV_1 pred. = 4.08 L.

p. % FVC pred. = 66.4% % FEV_1 pred. = 73.8%

q. FVC pred. = 4.11 L. FEV_1 pred. = 3.46 L.

r. % FVC pred. = 80.3% % FEV_1 pred. = 87.0%

FIGURE 9-14. VOLUME TIME CURVE – EXERCISE



EXERCISE 15.

(Refer to Figure 9-15, page 9-38. Volume Time Curve - Exercise.)

a. Do these curves meet acceptability criteria?

FEEDBACK:

a. These curves meet all acceptability criteria. The cough or variable effort in curve C is late in the maneuver and is so small (less than 50 ml) that it should not affect results. Remember that the next step would be to check reproducibility criteria.

EXERCISE 15. CONTINUED:

b. Calculate the FVCs and the FEV_1 in ATPS for each curve.

Curve A: FVC _____ FEV_1 _____

Curve B: FVC _____ FEV_1 _____

Curve C: FVC _____ FEV_1 _____

c. Determine whether there is excessive variability between the two largest FVCs and the two largest FEV_1s.

FVC variability _____ FEV_1 variability _____

FEEDBACK:

b. Curve A: FVC = 3.53 L. FEV_1 = 3.09 L.

Curve B: FVC = 3.52 L. FEV_1 = 3.05 L.

Curve C: FVC = 3.35 L. FEV_1 = 2.90 L.

c. FVC variability = 10 ml (0.3%) FEV_1 variability = 40 ml (1.3%)

Curves A and B meet reproducibility criteria.

EXERCISE 15. CONTINUED:

d. Calculate the FEV_1/FVC%.

e. Calculate the $FEF_{25-75\%}$.

FEEDBACK:

d. FEV_1 /FVC% = 87.5%

e. $FEF_{25-75\%}$ = 3.5 liters/sec (ATPS)

Best curve = A

25% of FVC = 0.88 L. 75% of FVC = 2.65 L.

EXERCISE 15. CONTINUED:

f. These curves are from a 55-year-old Caucasian male welder who is 69 inches tall. The ambient temperature was 75°F. He has participated annually in his company's respiratory surveillance program. Last year his FVC was 4.34 L.(BTPS) and his FEV_1 was 3.71 L.(BTPS). What was the absolute and percent change from last year?

Absolute change FVC: _____

% of FVC change: _____

Absolute change FEV_1: _____

% of FEV_1 change: _____

FEEDBACK:

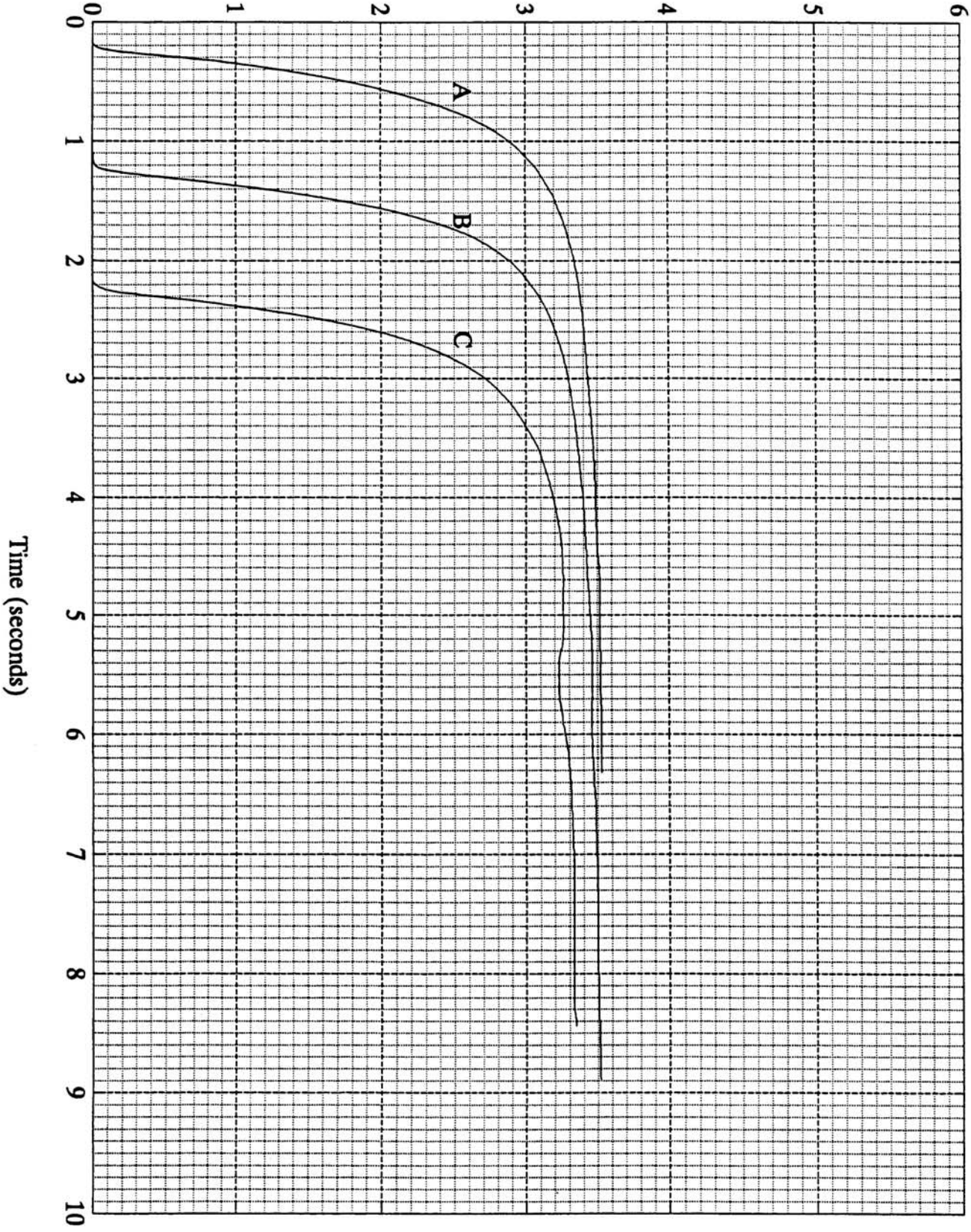
f. Absolute change FVC: -0.53 liters

% of FVC change: 12.2% decline

Absolute change FEV_1: -0.39 liters
% of FEV_1 change: 10.5% decline

Did you remember to convert the current year's test results to BTPS?

FIGURE 9-15. VOLUME TIME CURVE – EXERCISE



EXERCISE 16.

(Refer to Figure 9-16, page 9-45. Volume Time Curve - Exercise.)

a. Do at least three of these curves meet acceptability criteria?

FEEDBACK:

a. Yes. Curves A, B and C meet acceptability criteria. Curve D shows excessive extrapolated volume and early termination. To decrease the extrapolated volume, coach **Blast the Air out at first**.

EXERCISE 16. CONTINUED:

b. Calculate the FVC (ATPS) for the acceptable curves:

Curve A _____ Curve B _____ Curve C _____

c. Is there excessive variability between the two largest FVCs?

d. Calculate the FEV_1s for the acceptable curves:

Curve A _____ Curve B _____ Curve C _____

e. Is there excessive variability between the two largest FEV_1s?

FEEDBACK:

b. Curve A: FVC = 3.66 L.
Curve B: FVC = 3.60 L.
Curve C: FVC = 3.58 L.

c. No. The amount of variability is only 60 ml (1.6%) so reproducibility criteria are met.

d. Curve A: FEV_1 = 3.12 L.
Curve B: FEV_1 = 3.05 L.
Curve C: FEV_1 = 3.08 L.

e. No. The amount of variability is only 40 ml (1.3%), so reproducibility criteria are met.

EXERCISE 16. CONTINUED:

f. Convert the best FVC and FEV_1 to BTPS (the ambient temperature was 25°C).

FVC (BTPS) _____ FEV_1 (BTPS) _____

g. Calculate FEV_1/FVC%

FEV_1/FVC% _____

h. Calculate the $FEF_{25-75\%}$

$FEF_{25-75\%}$ _____

FEEDBACK:

f. FVC (BTPS) = 3.93 L. FEV_1 (BTPS) = 3.35 L.

g. FEV_1/FVC% = 85.2%

h. $FEF_{25-75\%}$ = 3.71 L/s (BTPS) Did you remember to convert BTPS?

Sum of best curve: 6.78 (Curve A)

25% of FVC = .92 L. 75% of FVC = 2.75 L.

EXERCISE 16. CONTINUED:

i. If these curves were from a 50-year-old Caucasian male, 190 cm tall, what would his predicted values be using Appendix L?

FVC pred. _____ FEV_1 pred. _____

j. What percent of the predicted are the following for the above individual?

% FVC pred. _____ % FEV_1 pred. _____

k. In the previous year's surveillance studies, his FVC was 5.01 L.(BTPS) and his FEV_1 was 4.02 L.(BTPS). Calculate the absolute and % changes for the FVC and FEV_1.

FVC absolute change _____ FVC% change _____

FEV_1 absolute change _____ FEV_1% change _____

l. Why would it be better to compare his current results to those of the previous year instead of to predicted values?

FEEDBACK:

i. FVC pred. = 5.90 L. FEV_1 pred. = 4.56 L.

j. % FVC pred. = 66.6% % FEV_1 pred. = 73.5%

k. FVC absolute change: -1.08 L.
FVC% change: 21.6% decline
FEV_1 absolute change: -0.67 L.
FEV_1% change: 16.7% decline

l. When compared to the previous year, this individual shows a greater than 15% drop in volume and FEV_1. These declines are beyond what would be expected for normal aging.

EXERCISE 16. CONTINUED:

m. If these curves were from a 50-year-old African-American male, 190 cm tall, what would his predicted values be using Appendix L?

FVC pred. _____ FEV_1 pred. _____

n. What are the percent of predicted and lower limit of normal (LLN) values for the above individual?

% FVC pred. _____ % FEV_1 pred. _____
FVC LLN _____ FEV_1 LLN _____

o. In the previous year's surveillance studies, his FVC was 4.13 L. (BTPS) and his FEV_1 was 3.60 L.(BTPS). Calculate the absolute and percent changes for the FVC and the FEV_1.

FVC absolute change _____ FVC% change _____

FEV_1 absolute change _____ FEV_1% change _____

p. What would his absolute and percentage change have been if his FVC had been 4.75 L. (BTPS) and his FEV_1 had been 3.87 L. (BTPS) in the previous year?

FVC absolute change _____ FVC% change _____

FEV_1 absolute change _____ FEV_1% change _____

q. Why would it be good to compare this individual's results to those from the previous year as well as to predicted values?

FEEDBACK:

m. FVC pred. = 4.95 L. FEV_1 pred. = 3.95 L.
Did you remember to use the race correction?

n. FVC% pred. = 79.4% FEV_1% pred. = 84.8%
FVC LLN = 3.87 L FEV_1 LLN = 3.00 L

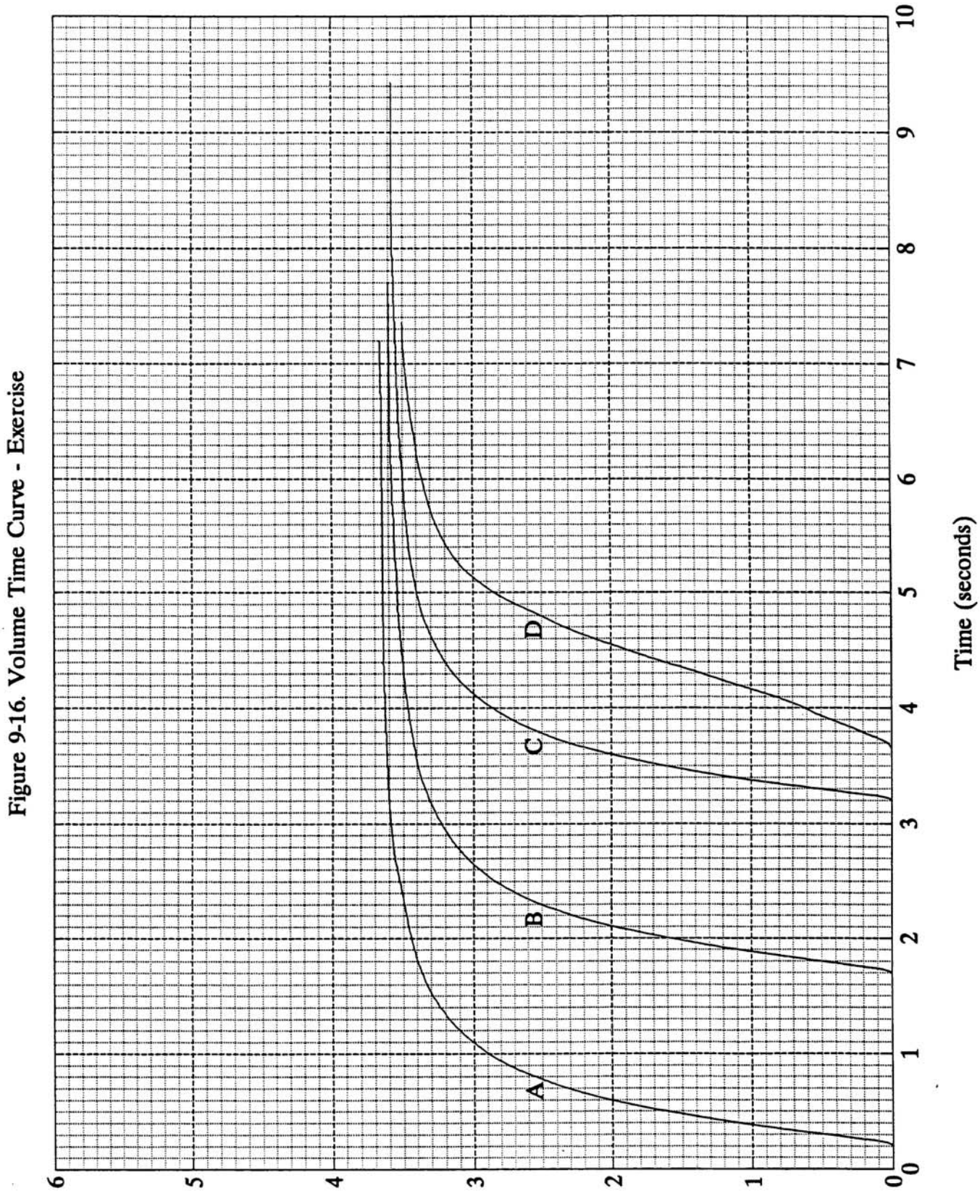
o. FVC absolute change = -0.20 L or -200 ml
FVC% change = 4.8% decline

FEV_1 absolute change = -0.25 L or -250 ml
FEV_1% change = 6.9% decline

p. FVC absolute change = -0.82 L or 820 ml
FVC% change = 17.3% decline
FEV_1 absolute change = -0.52 L or 520 ml
FEV_1% change = 13.4% decline

q. His values for the FVC and FEV_1 would be considered within the normal range because they are above the lower limit of normal (LLN). The use of the LLN is recommended by the ATS instead of percent predicted. His percent predicted FVC is 79.4% which is below 80% of predicted, but his observed FVC is 3.93 L which is above the FVC LLN of 3.87 L, so his FVC is considered normal. However, when compared to the previous year, he shows a greater than 15% drop in FVCs. This is beyond what would be expected for normal aging.

FIGURE 9-16. VOLUME TIME CURVE – EXERCISE



EXERCISE 17.

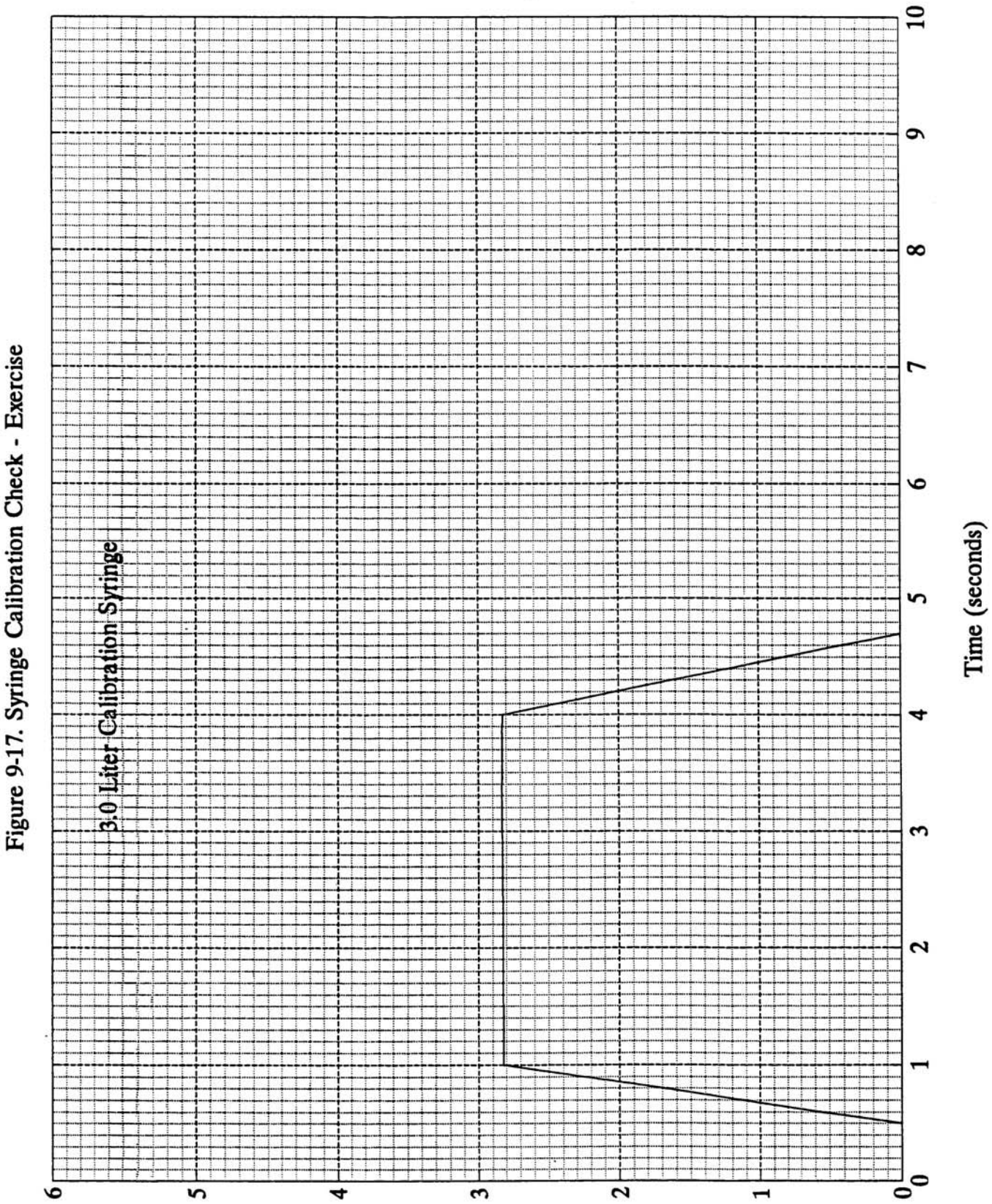
(Refer to Figure 9-17, page 9-47. Syringe Calibration Check - Exercise.)

a. The tracing in Figure 9-17 was made when you injected 3 liters of air with a calibrated syringe into your spirometer. Is your spirometer in need of repair?

FEEDBACK:

a. Yes. The tracing reads 2.83 liters, which is outside of the acceptable range (between 2.91-3.09). It is also 5.7% of 3 liters, which is outside the range of $\pm$3%.

FIGURE 9-17. SYRINGE CALIBRATION CHECK – EXERCISE



EXERCISE 18.

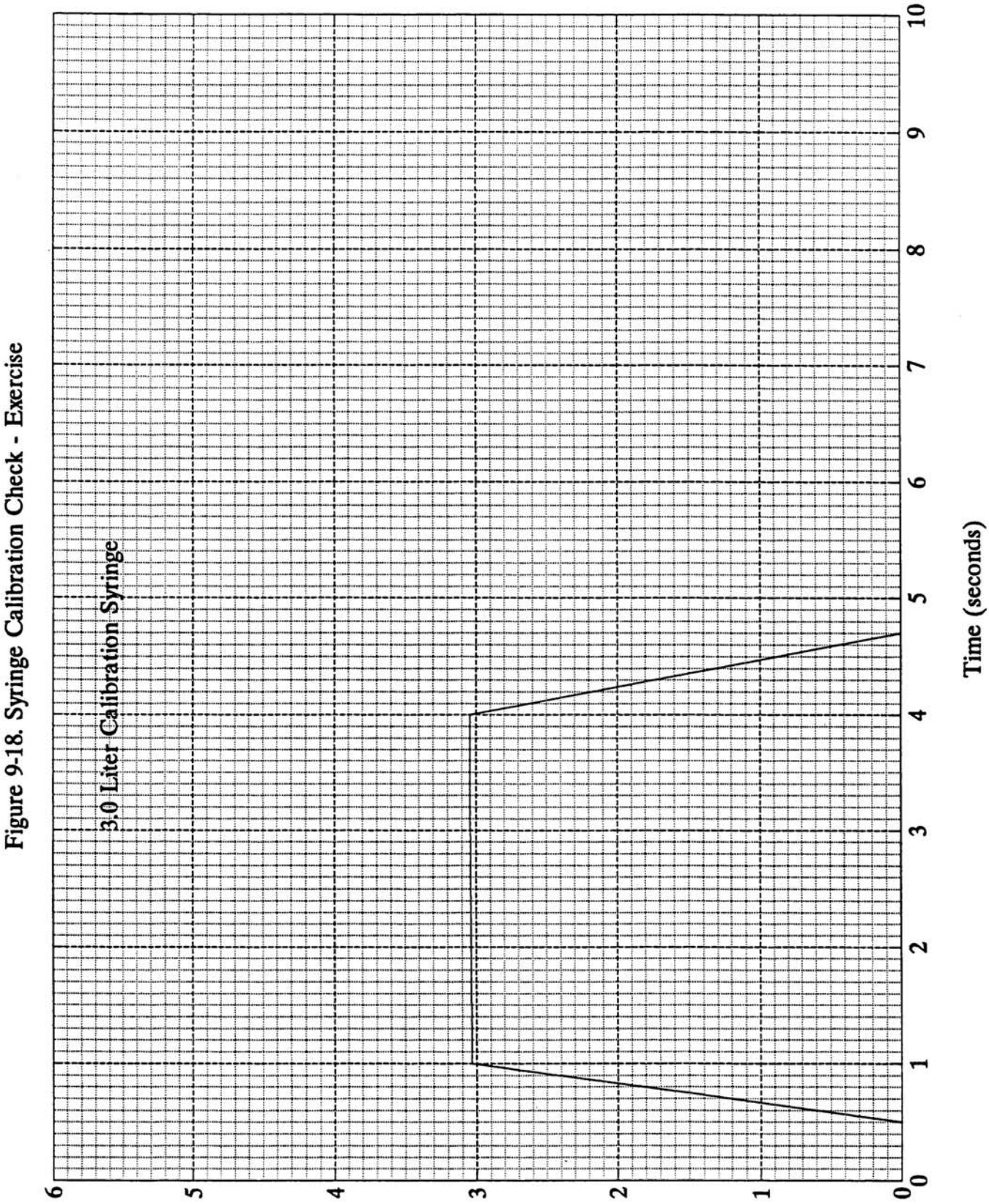
(Refer to Figure 9-18. Syringe Calibration Check - Exercise.)

a. Your spirometer has been repaired and you want to check that it is now properly recording volumes. The tracing in Figure 9-18 was made when you injected 3 liters of air with a calibrated syringe. Are the results acceptable?

FEEDBACK:

a. Yes. The tracing reads 3.04 liters, which is 1.3% more than 3 liters. This is in the acceptable range of $\pm$3% or between 2.91-3.09 liters.

FIGURE 9-18. SYRINGE CALIBRATION CHECK – EXERCISE



EXERCISE 19.

Consider the following 10 year record of FEV_1 and FVC for a male cotton worker. All results have been corrected for BTPS.

a. How do the 1989 values for FEV_1 and FVC compare with the previous high (expressed as an absolute change)?

b. How do these changes compare with the expected decline due to aging alone?

YEAR	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
FVC	5.34	5.40	5.32	5.30	5.28	5.27	5.26	5.24	5.21	5.19
FEV_1	4.37	4.38	4.35	4.34	4.31	4.30	4.28	4.22	4.21	4.16

FEEDBACK:

a. Previous high FVC (1981) = 5.40 L.
1989 FVC = 5.19 L.
Absolute change: -0.21 L.

Previous high FEV_1 (1981) = 4.38 L.
1989 FEV_1 = 4.16 L.
Absolute change: -0.22 L.

b. Expected decline in FVC for males = 0.025 L/year on the average.
8 years x 0.025 L/year = 0.20 L loss in FVC expected over 8 years.
The observed loss of 0.21 L. is approximately what would be expected simply due to aging.

Expected decline in FEV_1 for males = 0.030 L/year on the average.
8 years x 0.03 L/year = 0.24 L. loss in FEV_1 expected over 8 years.

The observed loss of 0.22 L over 8 years is not more than would be expected simply due to aging.

EXERCISE 20:

A 20-year-old Mexican-American male, 180 cm tall, is exposed to cotton dust on his job. His company performs routine pre-and post-shift spirometry as part of its medical surveillance program. The morning ambient temperature was 24°C. The afternoon ambient temperature was 27°C.

Results from the best FVCs and FEV_1s are given below:

Pre-shift:
FVC (ATPS) = 4.42 L. FEV_1 (ATPS) = 3.87 L.

Post-shift:
FVC (ATPS) = 3.82 L. FEV_1 (ATPS) = 3.33 L.

a. Calculate the following:

Pre-shift:
FEV_1 predicted (Appendix L) _____

FEV_1 %predicted_____

FEV_1/FVC% _____

Post-shift:
FEV_1 predicted (Appendix L) _____

FEV_1 %predicted_____

FEV_1/FVC% _____

Absolute change in FEV_1 _____

% change in FEV_1 _____

b. What would you say to the company doctor?

FEEDBACK:

a. Preshift:
FVC (BTPS) = 4.77 L. FEV_1 (BTPS) = 4.18 L.

Post-shift:
FVC (BTPS) = 4.06 L. FEV_1 (BTPS) = 3.54 L.

Pre-shift:
FEV_1% predicted: 84.6%
(Appendix L predicted 4.94 L.)
FEV_1/FVC%: 87.6%

Post-shift:
FEV_1% predicted: 71.7%
FEV_1/FVC%: 87.1%
Absolute change in FEV_1: -640 ml or 0.64 liters
Percentage change in FEV_1: 15.3% decline

b. Follow your company's reporting protocols, making sure that the large FEV_1 decline is brought to the attention of the health professional in charge of the respiratory surveillance program.

EXERCISE 21:

Your department gets a new director of occupational medicine who wants to know what your spirometry quality assurance program entails. How do you respond?

FEEDBACK:

Refer to **Unit Three: The Quality Assurance Program**, **Unit Four: Spirometric Technique**, **Unit Five: Basic Spirometric Calculations** and **Unit Six: Comparing Observed to Predicted Normal Values**. You would probably want to discuss:

a. How you ensure precision and accuracy of your equipment.

b. The measures you take to obtain acceptable and reproducible spirograms.

c. The predicted values used.

EXERCISE 22:

While you were on vacation, your substitute forgot to calibrate equipment according to your company's protocols. When you return, you discover that a 3-liter syringe calibration is 10% greater than it should be. What do you tell the company physician who wants to review the test results taken in your absence? What could you do to prevent this from happening again?

FEEDBACK:

Possible responses:

a. Refer to **Unit Three: The Quality Assurance Program** to explain to the company doctor why the results can't be used.

b. Review quality assurance procedures with your substitute before taking time off and explain the consequences of not carrying out the procedures.

EXERCISE 23:

While you were at a conference, your substitute performs spirometry on several subjects in an ongoing annual surveillance program. You take a look at the results before passing them on to the physician. One subject showed a significant decline in the FVC and FEV_1 from the previous year's results. You decide to call the subject to ask a few questions since the substitute didn't indicate any problems on the chart. You find out that the subject has just returned from medical leave for abdominal surgery. What should you do?

FEEDBACK:

Possible responses:

a. Inform the company doctor of the surgery.

b. Review other test results taken by the substitute to see if other "red flags" appear since he/she may have forgotten to check on which subjects should be postponed for spirometry.

c. Review subject selection criteria with your substitute.

EXERCISE 24.

You are training a new spirometry assistant. He suggests that since the room in which you perform the test is usually around 23°C, you could use that number all of the time to calculate BTPS. How do you respond?

FEEDBACK:

A possible response might be to measure your testing room over a week's time and document the temperature fluctuations, however minor. Then you could show your assistant how even a difference of a few degrees can affect tests results.

EXERCISE 25:

The new nurse in your unit wants to try out your spirometer. After she performs three acceptable and reproducible maneuvers, the computer prints out the following best results: FVC = 3.83 L. (ATPS); FEV_1 = 2.91 (ATPS).

She is 50 years old, Caucasian and 67 inches tall. The room temperature was 75°F.

a. You decide to draw a curve for her to explain what the results mean. Draw the FVC and FEV_1 on the attached graph paper, using volume (liters) as the vertical axes and time (seconds) as the horizontal axis.

b. What would her predicted values be using Appendix L? Add the predicted curve to the curve you already drew and label accordingly.

c. Calculate her percent of predicted values for:

   % FVC pred. _____ % FEV_1 pred. _____

FEEDBACK:

b. FVC pred. = 3.91 L. FEV_1 pred. = 3.09 L. Note: 67 inches is about 170 cm. 75°F is about 24°C

c. % FVC pred. = 105.9% % FEV_1 pred. = 101.6%
   Did you remember to convert to BTPS?

   FVC (BTPS) = 4.14 L. FEV_1 (BTPS) = 3.14 L.

EXERCISE 26:

The new nurse reads in a journal that spirometry alone is not adequate for a pulmonary surveillance program and she asks you for clarification. What do you tell her?

FEEDBACK:

Refer to **Unit Two: Overview of Spirometry**.