Arkansas CTE

# Aviation: Grades 9, 10, 11, 12

Adopted 2004

## Mathematics

**A: Extract roots, and raise numbers to a given power**

A001. Recognize and apply formulas involving the power of a number A001

**B: Determine areas and volumes of various geometrical shapes**

B001. Apply formulas to determine areas and volumes B001

B002. Compute wing area B002

B003. Calculate the volume of baggage compartments and fuel tanks B003

B004. Compute piston displacement B004

**C: Solve ratio, proportion, and percentage problems**

C001. Convert fractional numbers to decimal equivalents C001

C002. Determine ratio and percentage of numbers C002

C003. Compute compression ratios C003

**D: Perform algebraic operations involving addition, subtraction, multiplication, and division of positive and negative numbers**

D001. Recognize and apply algebraic applications D001

## Aircraft Drawings

**A: Use aircraft drawings, symbols, and system schematics**

A001. Identify lines and symbols A001

A002. Interpret dimensions A002

A003. Interpret electrical system drawings A003

A004. Use installation diagrams and schematics A004

**B: Draw sketches of repairs and alterations**

B001. Make sketches B001

**C: Use blueprint information**

C001. Read and interpret drawings C001

C002. Interpret installation diagrams C002

**D: Use graphs and charts**

D001. Use manufacturer's charts and graphs D001

## Basic Physics

**A: Use and understand the principles of simple machines: sound, fluid, and heat dynamics; basic aerodynamics; aircraft structures; and theory of flight**

A001. Determine the relationship of temperature and heat A001

A002. Determine the relationship of pressure, temperature, and volume of air mass A002

A003. Identify the factors affecting air pressure on an airfoil A003

A004. Identify the physical factors affecting engine output power A004

A005. Determine the relationship of pressure, area, and force A005

A006. Define inclined plane, level, and pulley A006

A007. Explain the origin of sound A007

A008. Define centrifugal/centripetal force A008

## Basic Electricity

**A: Determine the relationship of voltage, current, and resistance in electrical circuits**

A001. Calculate current A001

A002. Calculate voltage drop A002

A003. Determine the current flow-carrying capacity of wire A003

A004. Calculate electrical power A004

A005. Measure current flow in a parallel electrical circuit A005

A006. Demonstrate the characteristics of magnetism A006

A007. Demonstrate electromagnetic induction A007

**B: Measure voltage, current, resistance, continuity, and leakage**

B001. Explain the meaning of electrical quantity prefixes B001

B002. Demonstrate the use of DC electrical instruments B002

B003. Connect voltage and ammeters B003

B004. Demonstrate the use of a voltmeter B004

B005. Use an ohmmeter and/or test light for open or short circuits B005

B006. Detect electrical leakage B006

B007. Measure AC voltage B007

**C: Calculate and measure capacitance and inductance**

C001. Define capacitance, inductance, and impedance C001

C002. Measure capacitance in aircraft applications C002

**D: Calculate and measure electrical power**

D001. Determine aircraft electrical power requirements D001

**E: Read and interpret aircraft electrical circuit diagrams, including solid state devices and logic functions**

E001. Identify commonly used aircraft electrical and electronic symbols E001

E002. Read and interpret circuits with aircraft wiring diagrams E002

E003. Interpret electronic symbols and schematics in aircraft use, including solid state devices and logic functions E003

E004. Identify electrical malfunctions by reference to circuit diagrams E004

**F: Inspect and service batteries**

F001. Understand principles of battery construction and operation F001

F002. Identify characteristics of aircraft storage batteries F002

F003. Inspect and recharge aircraft storage batteries F003

F004. Perform removal, installation, and compartment maintenance of aircraft batteries F004

**Fluid Lines and Fittings**

**A: Fabricate and install rigid and flexible fluid lines and fittings**

A001. Bend aluminum and stainless steel tubing A001

A002. Perform beading of tubing A002

A003. Fabricate flares on tubing A003

A004. Fabricate and install flexible hoses A004

A005. Recognize defects in metal tubing A005

A006. Install a section of tubing A006

**Materials and Processes**

**A: Perform precision measurements**

A001. Inspect aircraft components for wear A001

**B: Identify and select aircraft hardware and materials**

- B001. Identify and install aircraft bolts B001
- B002. Identify aluminum alloys B002
- B003. Identify steel alloys B003
- B004. Recognize economic and engineering criteria in selection of aircraft materials B004
- B005. Identify rivets by physical characteristics B005
- B006. Identify materials used in aircraft firewalls and exhaust shrouds B006
- B007. Determine suitability of materials for aircraft repairs B007
- B008. Identify aircraft control cable B008

**C: Perform basic heat-treating processes**

- C001. Identify effects of heat treatment C001
- C002. Identify aluminum alloy code designation of heat treatability C002
- C003. Identify heat-treatment processes and strain relieving C003
- C004. Anneal copper and steel parts C004

**D: Perform dye penetrant, eddy current, ultrasonic, and magnetic particle inspection**

- D001. Perform dye penetrant, eddy current, and ultrasonic inspections D001
- D002. Perform magnetic particle inspections D002
- D003. Perform inspections of welded assemblies D003
- D004. Perform tests to distinguish between heat-treatable and weldable aluminum alloys D004

**E: Inspect and check welds**

- E001. Inspect and evaluate welds E001

**F: Identify and select appropriate nondestructive testing methods**

- F001. Identify aircraft uses for nondestructive testing F001
- F002. Discuss eddy current inspections F002

## Cleaning and Corrosion Control

**A: Identify ABND select cleaning materials**

- A001. Identify caustic materials A001
- A002. Identify cleaning agents for aircraft engine parts A002

**B: Inspect, identify, remove, and treat aircraft corrosion, and perform aircraft cleaning**

- B001. Inspect and clean exterior of aircraft B001
- B002. Identify corrosion B002
- B003. Remove corrosion B003
- B004. Apply protective coatings B004
- B005. Remove rust B005
- B006. Clean rubber products B006

**Ground Operation and Servicing**

**A: Identify and select fuels**

- A001. Identify aircraft fuels A001

**B: Start, ground operate, move, service, and secure aircraft, and identify typical ground operation hazards**

- B001. Start and operate aircraft engines B001
- B002. React to fire in induction system B002
- B003. Direct the movement of aircraft, and identify typical ground operation hazards B003
- B004. Prepare an aircraft for outside storage B004

**Maintenance Publications**

**A: Demonstrate ability to read, comprehend, and apply information contained in FAA and manufacturer's aircraft maintenance specifications, data sheets, manuals, publications, and related federal aviation regulations, airworthiness directives, and advisory material**

- A001. Locate reference data A001
- A002. Use information from aircraft specifications A002
- A003. Use information from the manufacturer's manuals to verify control surface travel A003
- A004. Identify and relate regulations governing airworthiness certificates A004
- A005. Select and use technical standard orders A005
- A006. Use manufacturer's manuals and other publications A006
- A007. Select and use supplementary type certificates, airworthiness directives, and advisory materials A007

**B: Read technical data**

- B001. Read, understand, and relate technical information B001

**Mechanic Privileges and Limitations**

**A: Exercise mechanic privileges within the limitations prescribed by FAR 65**

- A001. Interpret FAR 65 A001
- A002. Classify aircraft repairs A002
- A003. Interpret regulations governing repairs and alterations A003
- A004. Interpret repair station regulations A004
- A005. Recognize legal and ethical responsibilities A005

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**Maintenance Forms and Records**

**A: Write a description of work performed, including aircraft discrepancies and corrective action, using typical aircraft maintenance records**

- A001. Inspect an aircraft, and prepare a condition report A001
- A002. Write a description of major/minor repairs and routine maintenance A002

**B: Complete required maintenance forms, records, and inspection reports**

- B001. Make maintenance record entries B001
- B002. Use inspection guides B002
- B003. Evaluate aircraft records for compliance with Federal Air Regulations B003

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**Weight and Balance**

**A: Weight aircraft**

- A001. Locate, interpret, and apply weight and balance information A001

**B: Perform complete weight and balance check, and record data**

- B001. Solve weight and balance problems B001
- B002. Compute forward and after loaded center of gravity B002
- B003. Compute effect of equipment changes and loading schedules B003
- B004. Compute weight and balance on a helicopter B004
- B005. Examine weight and balance records B005