

**APPLIED MATHEMATICS, READING FOR INFORMATION, AND LOCATION  
INFORMATION**

**SAMPLE  
WORKKEYS  
ASSESSMENT  
ANSWERS**

## Applied Mathematics

### Level 3 Applied Mathematics Sample Item

In your job as a cashier<sup>1</sup> a customer gives you a \$20 bill to pay for a can of coffee that costs \$3.84. How much change should you give back?

1. \$15.26
2. \$16.16
3. \$16.26
4. \$16.84
5. \$17.16

Answer to Level 3 Sample Item

1.  $\$15.26 = \$20.00 - \$4.74$
2.  $\$16.16 = \$20.00 - \$3.84$  ...**correct**
3.  $\$16.26 = \$20.00 - \$3.74$
4.  $\$16.84 = \$20.00 - \$3.16$
5.  $\$17.16 = \$20.00 - \$2.84$

Why this is a Level 3 item:

- Examinees must perform a single subtraction operation.
- Numbers are presented in the logical order ( $\$20 - \$3.84$ ).
- Number of dollars must be converted to a decimal (dollars and cents: \$20.00).

### Level 4 Applied Mathematics Sample Item

Over the last 5 days, you made the following numbers of sales calls: 8, 7, 9, 5, and 7. On the average, how many calls did you make each day?

1. 5.8
2. 7.0
3. 7.2
4. 9.0
5. 36.0

#### Answer to Level 4 Sample Item

To get the average, first add up the numbers in the series, then divide the sum by the quantity of numbers in the series.

1.  $(8 + 7 + 9 + 5) + 5 = 5.8$ : Forgot to include the last 7
2. 7.0 is the mode value of the numbers in the series
3.  $(8 + 7 + 9 + 5 + 7) + 5 = 7.2$  ""**Correct**
4.  $\{8 + 7 + 9 + 5 + 7\} + 4 = 9$
5.  $8 + 7 + 9 + 5 + 7 = 36.0$ : Forgot to divide by 5

Why this is a Level 4 item:

- There is more than one step of logic and calculation.
- Examinees must divide using positive numbers.
- Examinees must figure out averages.

#### Level 5 Applied Mathematics Sample Item

Quik Call charges 18¢ per minute for long-distance calls. Econo Phone totals your phone usage each month and rounds the number of minutes up to the nearest 15 minutes. It then charges \$7.90 per hour of phone usage dividing this charge into 15-minute segments if you used less than a full hour. If your office makes 5 hours 3 minutes worth of calls this month using the company with the lower price, how much will these calls cost?

1. \$39.50
2. \$41.48
3. \$41.87
4. \$54.00
5. \$54.54

#### Answer for Level 5 Sample Item

To calculate Quik Call's price, convert 5 hours 3 minutes to minutes ( $60 \times 5 = 300$ ;  $300 + 3 = 303$  minutes) and then multiply this by the rate of 18¢ (\$0.18) per minute, which equals \$54.54. To calculate Econo Phone's price, round 5 hours 3 minutes up to 5 hours 15 minutes and then convert the 15 minutes to 1:14 or .25 hours. This value of 5.25 hours is multiplied by the rate of \$7.90 per hour to obtain \$41.48. Compare the two costs, \$54.54 and \$41.48 to determine the lower cost.

1.  $5 \text{ hr} \times \$7.90/\text{hr} = \$39.50$
2.  $5.25 \text{ hr} \times \$7.90/\text{hr} = \$41.48$  **correct**
3.  $5.3 \text{ hr} \times \$7.90/\text{hr} = \$41.87$

4.  $5 \text{ hr} \times 60 \text{ min/hr} \times 18\text{¢/min} = \$54.00$
5.  $5 \text{ hr} \times 60 \text{ min/hr} = 300 \text{ min}$ ;  $303 \text{ min} \times 18\text{¢/min} = \$54.54$

Why this is a Level 5 item:

- There are several steps of logic and calculation.
- Examinees must perform calculations using mixed numbers.
- Examinees must compare their answers with two sets of calculations and choose the 11 best deal."

### Level 6 Applied Mathematics Sample Item

You are preparing to tile the floor of a rectangular room that is 15112 feet by 18Y:z feet in size. The tiles you plan to use are square, measuring 12 inches on each side, and are sold in boxes that contain enough tile to cover 25 square feet. How many boxes of tiles must you order to complete the job?

1. 11
2. 12
3. 34
4. 59
5. 287

Answer to Level 6 Sample Item

First, convert 15112 to 15.5 and 18112 to 18.5 and multiply these two values to obtain the area of the room in square feet. Next, divide this number (286.75) by the area covered by one box of tiles (25 sq ft). Finally, round 11.47 boxes up to 12 boxes, as it is probably not possible to order a fraction of a box of tiles.

1. 15Yz becomes 15.5 and 18Yz becomes 18.5;  $15.5 \times 18.5 = 286.75 \text{ sq ft}$ ;  $286.75 \text{ sq ft} \div 25 = 11.47$ , then rounded down to 11boxes
2. 15Yz becomes 15.5 and 18Yz becomes 18.5;  $15.5 \times 18.5 = 286.75 \text{ sq ft}$ ;  $286.75 \text{ sq ft} \div 25 = 11.47$ , then rounded up to 12 boxes ....**correct**
3.  $15.5 + 18.5 = 34$ : Added the room dimensions
4.  $15.5 + 18.5 + 25 = 59$ : Added all the dimensions given in feet
5.  $15.5 \times 18.5 = 286.75$ , then rounded up to 287: The area of the room in square feet

Why this is a Level 6 item:

- Examinees must do multiple steps of logic, calculations, or conversion.
- Examinees must use mixed numbers.
- Examinees must eliminate unnecessary information.
- Examinees must find the area of a basic shape and use the result in further calculations.

### Level 7 Applied Mathematics Sample Item

The farm where you just started working has a vertical cylindrical oil tank that is 2.5 feet across on the inside. The depth of the oil in the tank is 2 feet. If 1 cubic foot of space holds 7.48 gallons, about how many gallons of oil are left in the tank?

1. 37
2. 59
3. 73
4. 230
5. 294

#### Answer to Level 7 Sample Item

First, look up the formula for the volume of a cylinder ( $V = \pi r^2 h$ ). Next, divide the diameter

(2.5 ft) by 2 to find the radius (1.25 ft) and calculate the volume of the cylinder (9.81 cu ft). Finally, the volume must be multiplied by 7.48, the number of gallons per cubic foot, to find the number of gallons remaining in the tank.

1. Multiplied  $2.5 \times 2 \times 7.48 = 37.4$ , then rounded down to 37
2. Forgot to square 1.25;  $3.14 \times 1.25 \times 2 \times 7.48 = 58.72$ , then rounded up to 59
3.  $2.5 \div 2 = 1.25$ ;  $3.14 \times (1.25)^2 \times 2 = 9.81$  cu ft;  $9.81$  cu ft  $\times 7.48$  gal/cu ft = 73.4 gallons, then rounded down to 73 ....**correct**
4.  $(1.25 \times 3.14) \times 2 \times 7.48 = 230.47$ , then rounded down to 230
5.  $3.14 \times (2.5)^2 \times 2 \times 7.48$  gal/cu ft = 293.59 gallons, then rounded up to 294: Used diameter 2 instead of the radius

Why this is a Level 7 item:

- There are multiple steps of calculation.
- Examinees must look up and use the formula for the volume of a cylinder.
- Examinees must convert from cubic feet to gallons.

## Reading for Information

### Level 3 Reading for Information Sample Item

#### ATTENTION CASHIERS:

All store employees will now get 20% off the price of clothes they buy here'. Please follow the new directions listed below.

#### Selling clothes to employees

- Ask to see the employee's store identification card.
- Enter the employee's department code number into the cash register.
- Use the cash register to take 20% off the price. Then push the sales tax button.
- Write your initials on the sales receipt.
- Sell clothes to employees during store hours only.

#### Accepting clothing returns from employees

- Employees receive a store credit certificate for clothes they return to the store.
- Store credit certificates are next to the gift certificates.
- Employees may not get a cash refund for clothes they return to the store.

You are a cashier. According to the notice shown, what should you write on a store employee's receipt?

- A. The employee's identification number
- B. The employee's department number
- C. The amount of sales tax
- D. The 20% discount price
- E. Your initials

#### Answers for Level 3 Sample item

- A. The employee has to show an id card, but you are not instructed to write down the number.
- B. You are instructed to enter the department number into the cash register, not the receipt.
- C. You are instructed to push the sales tax button for this step.
- D. You are instructed to use the cash register to take 20% off the price.
- E. The notice states, "Write your initials on the receipt." **Correct**

Why this is a Level 3 sample item:

- The sentences are simple and direct. Most put the subject first and the verb second.
- There are short paragraphs and short sentences.
- There are direct instructions for simple tasks.
- The vocabulary includes common everyday words.
- Individuals have to pick out a clearly stated detail. They do not need to draw any conclusions.

#### Level 4 Reading for Information Sample Item

INSTRUCTIONS TO SORTING DEPARTMENT: SPECIAL PROJECT TO FIX ORDER #888

Five long, blue plastic bins have been placed over by the overhead door. Piled on the other side of this room, near the time clock, are several thousand steel rods of varying lengths. All of those rods must be sorted by length and placed in the bins.

Bin "1" is for rods that are four to five meters long.

Bin "2" is for rods that have a length of over five meters, up to six meters. Bin "3" is for rods that have a length of over six meters, up to eight meters. Bin "4" is for rods that have a length of over eight meters, up to ten meters. Bin "5" is for warped or unsmoothed rods. These will not be accepted.

If these rods are not all sorted correctly, the customer will reject the order. We cannot afford to let that happen again. Work as quickly as you can because Friday is the deadline for delivery of the order.

According to the instructions shown, what is a condition for project success other than delivery on time?

- A. All rods must be sorted by both length and diameter.
- B. Rods eleven meters long must be leaned against the overhead door.
- C. The customer does not want rods that are warped.
- D. The five-meter-long rods must go in Bin 2.
- E. The ten-meter-long rods must arrive at the customer in Bin 4.

Answer to Level 4 Sample Item

- A. The instructions state no requirement of checking diameter, even though they mention sorting by length.
- B. The instructions mention no such rods.
- C. The instructions mention the unacceptability of the warped ones. **Correct**
- D. The instructions plainly say to put those rods in a bin other than 2.
- E. The instructions do not say the rods will stay in these bins all the way to the customer; each binful could be dumped into a separate truck and delivered that way.

Why this is a Level 4 item:

- Sentences are longer, although still straightforward.

- Sentence structure is varied, and some introductory phrases are used.
- There are a number of details.
- Individuals must choose what to do when changing conditions call for a different action.

### Level 5 Reading for Information Sample Item

Goldberg's Auto Parts is served by more than fifty different accounts, each with its own sales representative, company name, corporate address, and shipping address. As a shipping and receiving clerk at Goldberg's, you are required to return defective merchandise to the manufacturer.

Standard procedure for returning an item begins with your written request to the company for authorization. Always send the request to the corporate address, not to the shipping address. Unless the company file folder contains a form for this procedure, write a business letter to the manufacturer supplying the item's stock number, cost, and invoice number; the date it was received; and the reason for its return. The manufacturer's reply will include an authorization number from the sales representative, a sticker for you to place on the outside of the box to identify it as an authorized return, and a closing date for the company's acceptance of the returned item. If you do not attach the provided sticker, your returned box will be refused by the manufacturer as unauthorized, and you will need to obtain a new letter, authorization, sticker, and closing date. Always send a returned box to the shipping address, not to the company's corporate address.

According to the policy shown, what should you do if you lose an authorization sticker?

1. Send a request for a return authorization along with the rejected part directly to the manufacturer's shipping address.
2. Send a request for return authorization along with the rejected part directly to the manufacturer's corporate address.
3. Repeat the standard procedure to obtain a new letter, authorization, sticker, and closing date.
4. Use a sticker from another company's folder.
5. Send the rejected part to your sales representative.

### Answer to Level 5 Sample Item

1. Although it is correct that returned boxes should be sent to the manufacturer's shipping address, the box will be refused if it does not have an authorization sticker.
2. Returned boxes should not be sent to the manufacturer's corporate address, and the box would be refused without an authorization sticker.
3. The passage states, "If you do not attach the provided sticker, your returned box will be refused by the manufacturer as unauthorized, and you will need to obtain a new letter, authorization, sticker, and closing date." Therefore, if you lose the original authorization sticker, you will have to repeat the standard procedure to get a new letter, etc. **Correct**
4. An authorization sticker from another company would not have the correct authorization number from the manufacturer's sales representative.
5. The sales representative provides the authorization number, but the rejected part goes to the manufacturer's shipping address after the authorization sticker has been received. The rejected parts do not go to the sales representative.

Why this is a Level 5 item:

- Sentences are longer and more complex.



- The document contains many steps to be followed and details to be considered.
- The vocabulary includes some jargon and specialized terms.
- Instructions include conditionals.
- Individuals must apply straightforward instructions to a new situation that is similar to the one described in the material.

### **Level 6 Reading for Information Sample Item**

From: J. Kimura, Senior Vice President of Molten Metals, Inc. To: All e-mail users at Molten Metals, Inc.

To permit our employees to communicate directly with one another as well as with vendors and customers, Molten Metals, Inc. provides a network of e-mail accounts. Access to e-mail is at the sole discretion of Molten Metals, Inc., and we will determine who is to be so empowered. Under President Duarte's leadership, all messages sent and received (even those intended as personal) are treated as business messages. Molten Metals, Inc. has the capability to and reserves the right to access, review, copy, and delete any messages sent, received, or stored on the company e-mail server. Molten Metals, Inc. will disclose these messages to any party (inside or outside the company) it deems appropriate. Employees should treat this server as a constantly reviewed, shared file stored in the system.

Due to the reduced human effort required to redistribute electronic information, a greater degree of caution must be exercised by employees transmitting MM, Inc. confidential information using company e-mail accounts. Confidential information belonging to MM, Inc. is important to our independence and should never be transmitted or forwarded to persons or companies not authorized to receive that information. Likewise, it should not be sent or forwarded to other employees inside the company who do not need to know that information.

MM, Inc. strongly discourages the storage of large numbers of e-mail messages for a number of reasons. First, because e-mail messages frequently contain company confidential information, it is good to limit the number of such messages to protect the company's information. Second, retention of messages fills up large amounts of storage space on the e-mail server and personal hard disks, and can slow down the performance of both the network and individual personal computers. Finally, in the event that the company needs to search the network server, backup tapes, or individual hard disks for genuinely important documents, the fewer documents it has to search through, the more economical the search will be. Therefore, employees are to delete as soon as possible any e-mail messages they send or receive.

Based on the memo shown, personal messages transmitted or received using Molten Metals, Inc., e-mail accounts will be:

- A. automatically deleted upon detection
- B. avoided by server staff to save company time
- C. forwarded to private, personal accounts
- D. grounds for personnel action
- E. treated no differently from other messages

Answer to Level 6 Sample Item

- A. The memo states that the company has the capability to and reserves the right to . . . delete any messages on the company server, but it does not say that anything will be automatically deleted.
- B. It is the number of e-mail messages that cost company time when doing a search, not the type, and for that reason, employees are asked to delete as many messages as possible.

- C. Employees are asked to delete unnecessary messages but the memo does not suggest saving any of the messages anywhere else.
- D. There is no mention of personnel action in the memo.
- E. The memo states that "all messages sent and received (even those intended as personal) are treated as business messages." Other than that statement, there is no differentiation between business and personal messages. **Correct**

Why this is a Level 6 item:

- The material is taken from a regulatory document.
- The sentences are formal and complicated.
- The paragraphs and sentences are filled with details and information.
- Sentences are long and more varied.
- Less common meanings of words are used.
- Examinees must apply complicated instructions to new situations.

### **Level 7 Reading for Information Sample Item**

#### **Confidentiality**

Client and Consultant agree to maintain the confidentiality of each other's trade secrets and any confidential business information disclosed during the term of this agreement, except as authorized by the party that disclosed the information. When the consulting services have been completed, the parties will return all confidential materials and equipment provided during the term of this agreement, unless keeping the materials is authorized by the party that provided them. Each party is responsible for identifying all trade secrets, confidential business information, and confidential materials.

Nothing in this or in any other agreement will prevent any party from using or disclosing confidential information to the extent necessary to carry out the responsibilities in this agreement; or will restrict any party's use or disclosure of information that is or becomes publicly known through lawful means, that was rightfully in that party's possession or part of that party's general knowledge prior to the term of this agreement, or that is disclosed to that party without confidential or proprietary restrictions by a person who rightfully possesses the information; or will prevent any party from responding to a lawful subpoena or court order.

Client agrees that Consultant will neither use nor disclose the trade secrets, confidential information, or confidential materials of third parties, and Client will neither ask nor require Consultant to do so.

#### **Miscellaneous Provisions**

All agreements and understandings between the parties concerning the subject matter of this agreement are embodied in this agreement and any proposal to which the parties agreed. It is understood and agreed by both parties that there are no oral or other agreements or understanding between the parties affecting this agreement.

This agreement shall supersede all prior and contemporaneous agreements and understandings between the parties, with respect to any subject covered by this agreement, except as otherwise provided in this agreement.

This agreement may not be amended except in writing by an instrument signed by each of the parties. No failure or delay in exercising any right under this agreement shall operate as a waiver thereof.

Neither party shall assign or otherwise transfer any rights or obligations under this agreement without the written consent of the other party. Subject to the foregoing agreement, this agreement shall be binding upon and shall inure to the benefit of the parties' respective heirs, successors, attorneys, and permitted assignees.

If any provision of this agreement, or its application to any person, place, or circumstance, is held by an arbitrator or a court of competent jurisdiction to be invalid, unenforceable, or void, such provision shall be enforced to the greatest extent permitted by law, and the remainder of this agreement and such provision as applied to the other persons, places, and circumstances shall remain in full force and effect.

This agreement shall not become binding on either party until both parties execute it.

You have hired a consultant to work with your firm. Based on the agreement shown, what will happen if the consultant's business is taken over by a major competitor?

- A. The agreement will confidentially go into arbitration.
- B. The agreement will not be enforceable and is void.
- C. The consultant is bound by the agreement.
- D. The obligations will pass to the new owner.
- E. You must renegotiate the agreement with the new owner.

Answer to Level 7 Sample Item

- A. *The agreement will confidentially go into arbitration.* There is nothing stated or implied in this agreement to indicate that the assignment must be confidential or go to arbitration. Attractive because it might be the only way to compel completion of the work or compliance with the agreement.
- B. *The agreement will not be enforceable and is void.* Attractive because the terms of the agreement might be all but impossible to enforce because the new owner was not a party to the original agreement. However, unenforceability is decided by arbitration or a court of law.
- C. *The consultant is bound by the agreement.* The agreement states, "Neither party shall assign or otherwise transfer any rights or obligations under this agreement without the written consent of the other party." Not too obvious because the consultant no longer operates the business, but the consultant is not released from the agreement without the client's written consent. ""

**Correct**

- D. *The obligations will pass to the new owner.* Incorrect because the consultant may not transfer rights or obligations without the client's written consent. Attractive because the agreement states, "this agreement shall be binding upon and shall inure to the benefit of the parties' respective heirs, successors, attorneys, and permitted assignees," meaning that the terms of the agreement may be transferred, but the transfer is subject to the written consent of the other party.
- E. *You must renegotiate the agreement with the new owner.* You may wish to use the new owner in a consulting capacity, but there is no obligation under this agreement to do so.

Why this is a Level 7 item:

- Sentences are longer, denser, and more complex.
- The document uses a complex writing style.
- The paragraphs and sentences are filled with details and information.
- Less common meanings of words are used.
- Individuals must apply the principles behind complicated instructions to new situations.

## Locating Information

### Level 3 Locating Information Sample Item



You regularly check the pressure gauge on a large tank. According to the gauge shown, what is the current pressure (in PSI)?

1. 30
2. 35
3. 40
4. 45
5. 100

### Answer to Level 3 Sample Item

1. The graduations are by 10s not 20s. Attractive because if graduations were by 20s, the pressure would be about 30 (between 20 and 40).
2. The graduations are by 10s and therefore the major line between 20 and 40 would be 30. The needle, though, lies between this graduations (30) and 40, so it reads 35 as best choice.  
**correct**
3. Attractive because needle is closer to 40 than 20, but 35 is best choice.
4. Attractive to those who read 40 and then increase counterclockwise by 5 to get 45.
5. The needle is to be read using the pointed end. Attractive because the short, wide end of the needle points to 100.

Why this is a Level 3 item:

- The problem contains an elementary workplace graphic.
- Examinees find one piece of information.

## Level 4 Locating Information Sample Item

75053

FRESH 'N' CLEAN      555-6301      4:16 PM 8/26  
 1200 14TH ST  
 MAPLETON, OH 45768

PHONE 555-2261      DATE 8-29      CLERK'S INITIALS SW

PRINT NAME EDNA THOMPSON

ADDRESS

Field	On Hangers	Starch	NO	LT	MED	HVY
	X	X		X		
Day	MON	TUE	WED	THUR	FRI	
	X					

<input checked="" type="checkbox"/>	TROUSER		TROUSER
	SHIRT		SHIRT
	DRESS		OVERCOAT
	BLOUSE		SWEATER
	SKIRT		DRESS
	JACKET		BLOUSE
			SKIRT
			JACKET
			TIE

You must sort clothes in a dry-cleaning establishment according to the customer's instructions. According to the form shown, how should this customer's shirt be treated?

1. Dryclean it, add light starch, and fold it.
2. Dryclean it, add light starch, and place it on a hanger.
3. Launder it with no starch and place it on a hanger.
4. Launder it with light starch and place it on a hanger.
5. Launder it with medium starch and fold it.

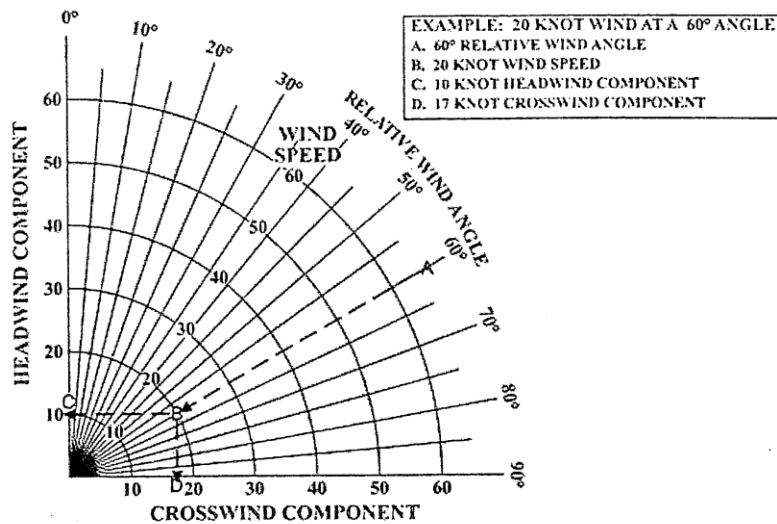
Answer to Level 4 Sample Item

1. You are to launder the shirt rather than dry clean, and it should not be folded.
2. You are to launder the shirt rather than dry clean.
3. The shirt should be starched lightly.
4. The shirt is to be laundered and then starched (light) and on a hanger. **..Correct**
5. The shirt should be starched lightly not medium, and it should not be folded.

Why this is a Level 4 item:

- The problem contains a straightforward graphic.
- Examinees must summarize information.

## Level 5 Locating Information Sample Item



As an airplane pilot, you need to determine the crosswind component of the wind speed to ensure safe takeoffs and landings. According to the graph shown, if the reported wind speed is 45 knots at a 20° angle, what is the crosswind component, in knots?

- A. 15
- B. 25
- C. 43
- D. 45
- E. 65

Why this is a Level 5 item:

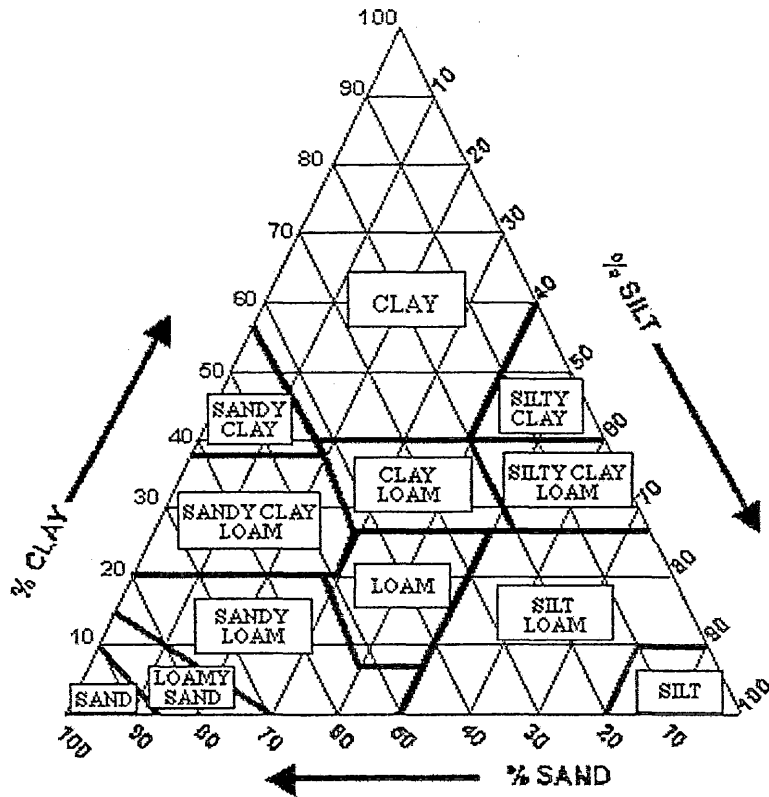
- The problem uses a graph with a less common format.
- Examinees must sort through distracting information in a complicated graph using three scales.

Answer to Level 5 Sample Item

1. First, locate the 20-degree line on the "Relative Wind Angle" scale. Move along this line to halfway between the 40- and 50-knot arc lines. This is the 45-knot wind speed point. From this point, drop straight down to the "Crosswind Component" axis to a point halfway between 10 and 20. This is the crosswind component, 15 knots. **Correct**
2. The intersection between 20 on the Crosswind Component axis and 45 on the "Headwind Component" axis falls on the 25-degree line for relative wind angle, but this does not account for the value of 20 degrees for relative wind angle.
3. 43 knots is the headwind component for a wind speed of 45 knots at a 20 degree angle, but the question asks for the crosswind component, not the headwind component.
4. This reflects an incorrect reading of the chart based on following the 20 value from the "Headwind Component" axis down to the crosswind component value of 45.

5. The intersection of 20 on the 11 Headwind Component 11 axis and 45 on the 11 Crosswind Component 11 axis is near the 65-degree line for relative wind angle, but the question asks for the crosswind component, not a wind angle value.

Level 6 Locating Information Sample Item



Soil name	Texture class	Depth (inches)	Shrink-swell potential
Sarpy	sandy loam	0-7 7-60	low low to moderate
Kennebec	silt loam	0-38 38-60	moderate low to moderate
Colo	silty clay loam	0-31 31-60	high high
Blend	silty clay	0-17 17-29 29-60	high moderate to high high
Nevin	clay loam	0-28 28-48 48-60	moderate to high moderate moderate
Kenmoor	loamy sand	0-24 24-60	low high

You are a road contractor and you have analyzed a soil that you want to use for road fill. Your analysis shows that the soil contains 15% sand, 65% silt, and 20% clay. You need to know what the shrink-swell potential is for the soil because it will affect the durability of the road. Based on the diagram and table shown, what is the shrink-swell potential at a 30-inch depth for this soil?

- A. Low
- B. Low to moderate
- C. Moderate
- D. Moderate to high
- E. High

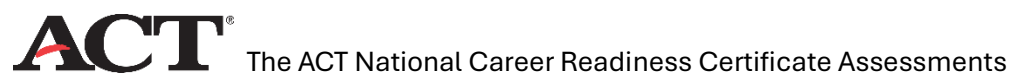
Why this is a Level 6 item:

- The problem is based on very complicated, detailed graphics in a challenging format.
- Examinees must notice the connections between graphics.
- Examinees must apply the information to a specific situation

Answer to Level 6 Sample Item

1. The shrink-swell potential for silt loam is low (to moderate) at range 38-60", but you are interested in 30"
2. The shrink-swell potential for silt loam is low to moderate at range 38-60", but you are interested in 30"
3. The shrink-swell potential for silt loam at 0-38" is moderate, so the shrink-swell potential for 30" is moderate. **Correct**
4. The shrink-swell potential for silt loam at 30" is moderate, but does not range to high.
5. The shrink-swell potential for silt loam does not range to high.





## **APPLIED MATHEMATICS, READING FOR INFORMATION, AND LOCATION INFORMATION**

### **SAMPLE WORKKEYS ASSESSMENT ANSWERS**

## Applied Mathematics

### Answer to Level 3 Sample Item

1.  $\$15.26 = \$20.00 - \$4.74$
2.  $\$16.16 = \$20.00 - \$3.84$  **..correct**
3.  $\$16.26 = \$20.00 - \$3.74$
4.  $\$16.84 = \$20.00 - \$3.16$
5.  $\$17.16 = \$20.00 - \$2.84$

### Answer to Level 4 Sample Item

To get the average, first add up the numbers in the series, then divide the sum by the quantity of numbers in the series.

1.  $(8 + 7 + 9 + 5) + 5 = 5.8$ : Forgot to include the last 7
2. 7.0 is the mode value of the numbers in the series 3.  $(8 + 7 + 9 + 5 + 7) + 5 = 7.2$  **..-.Correct**
4.  $(8 + 7 + 9 + 5 + 7) + 4 = 9$
5.  $8 + 7 + 9 + 5 + 7 = 36.0$ : Forgot to divide by 5

### Answer to Level 5 Sample Item

To calculate Quik Call's price, convert 5 hours 3 minutes to minutes ( $60 \times 5 = 300$ ;  $300 + 3 = 303$  minutes) and then multiply this by the rate of 18¢ (\$0.18) per minute, which equals \$54.54. To calculate Econo Phone's price, round 5 hours 3 minutes up to 5 hours 15 minutes and then convert the 15 minutes to 114 or .25 hours. This value of 5.25 hours is multiplied by the rate of \$7.90 per hour to obtain \$41.48. Compare the two costs, \$54.54 and \$41.48, to determine the lower cost.

1.  $5 \text{ hr} \times \$7.90/\text{hr} = \$39.50$
2.  $5.25 \text{ hr} \times \$7.90/\text{hr} = \$41.48$  **...correct**
3.  $5.3 \text{ hr} \times \$7.90/\text{hr} = \$41.87$
4.  $5 \text{ hr} \times 60 \text{ min/hr} \times 18\text{¢/min} = \$54.00$
5.  $5 \text{ hr} \times 60 \text{ min/hr} = 300 \text{ min}$ ;  $303 \text{ min} \times 18\text{¢/min} = \$54.54$

### Answer to Level 6 Sample Item

First, convert 15Y2 to 15.5 and 18Y1h to 18.5 and multiply these two values to obtain the area of the room in square feet. Next, divide this number (286.75) by the area covered by one box of tiles (25 sq ft). Finally, round 11.47 boxes up to 12 boxes, as it is probably not possible to order a fraction of a box of tiles.

1. 15Yz becomes 15.5 and 18Yz becomes 18.5;  $15.5 \times 18.5 = 286.75$  sq ft;

$286.75 \text{ sq ft} \div 25 = 11.47$ , then rounded down to 11 boxes

2. 15Yz becomes 15.5 and 18Yz becomes 18.5;  $15.5 \times 18.5 = 286.75$  sq ft;

$286.75 \text{ sq ft} \div 25 = 11.47$ , then rounded up to 12 boxes **correct**

3.  $15.5 + 18.5 = 34$ : Added the room dimensions

4.  $15.5 + 18.5 + 25 = 59$ : Added all the dimensions given in feet

5.  $15.5 \times 18.5 = 286.75$ , then rounded up to 287: The area of the room in square feet

### Answer to Level 7 Sample Item

First, look up the formula for the volume of a cylinder ( $V = \pi r^2 h$ ). Next, divide the diameter (2.5 ft) by 2 to find the radius (1.25 ft) and calculate the volume of the cylinder (9.81 cu ft). Finally, the volume must be multiplied by 7.48, the number of gallons per cubic foot, to find the number of gallons remaining in the tank.

1. Multiplied  $2.5 \times 2 \times 7.48 = 37.4$ , then rounded down to 37
2. Forgot to square 1.25;  $3.14 \times 1.25 \times 2 \times 7.48 = 58.72$ , then rounded up to 59
3.  $2.5 \div 2 = 1.25$ ;  $3.14 \times (1.25)^2 \times 2 = 9.81$  cu ft;  $9.81$  cu ft  $\times 7.48$  gal/cu ft = 73.4 gallons, then rounded down to 73  
...correct
4.  $(1.25 \times 3.14)^2 \times 2 \times 7.48 = 230.47$ , then rounded down to 230
  - s.  $3.14 \times (2.5)^2 \times 2 \times 7.48$  gal/cu ft = 293.59 gallons, then rounded up to 294: Used diameter<sup>2</sup> instead of the radius

### Reading for Information Answer to Level 3 Sample Item

- A. The employee has to show an id card, but you are not instructed to write down the number.
- B. You are instructed to enter the department number into the cash register, not the receipt.
- C. You are instructed to push the sales tax button for this step.
- D. You are instructed to use the cash register to take 20% off the price.
- E. The notice states, "Write your initials on the receipt." ... Correct

### Answer to Level 4 Sample Item

- A. The instructions state no requirement of checking diameter, even though they mention sorting by length.
- B. The instructions mention no such rods.
- C. The instructions mention the unacceptability of the warped ones. ... Correct
  - D. The instructions plainly say to put those rods in a bin other than 2.
  - E. The instructions do not say the rods will stay in these bins all the way to the customer; each binful could be dumped into a separate truck and delivered that way.

### **Answer to Level 5 Sample Item**

1. Although it is correct that returned boxes should be sent to the manufacturer's shipping address, the box will be refused if it does not have an authorization sticker.
2. Returned boxes should not be sent to the manufacturer's corporate address, and the box would be refused without an authorization sticker.
3. The passage states, "If you do not attach the provided sticker, your returned box will be refused by the manufacturer as unauthorized, and you will need to obtain a new letter, authorization, sticker, and closing date." Therefore, if you lose the original authorization sticker, you will have to repeat the standard procedure to get a new letter, etc. ... Correct
4. An authorization sticker from another company would not have the correct authorization number from the manufacturer's sales representative.
5. The sales representative provides the authorization number, but the rejected part goes to the manufacturer's shipping address after the authorization sticker has been received. The rejected parts do not go to the sales representative.

### Answer to Level 6 Sample Item

- A. The memo states that the company "has the capability to and reserves the right to . . . delete" any messages on the company server, but it does not say that anything will be automatically deleted.
- B. It is the number of e-mail messages that cost company time when doing a search, not the type, and for that reason, employees are asked to delete as many messages as possible.
- C. Employees are asked to delete unnecessary messages but the memo does not suggest saving any of the messages anywhere else.
- D. There is no mention of personnel action in the memo.
- E. The memo states that "all messages sent and received (even those intended as personal) are treated as business messages." Other than that statement, there is no differentiation between business and personal messages . . . \_ Correct

### Answer to Level 7 Sample Item

- A. *The agreement will confidentially go into arbitration.* There is nothing stated or implied in this agreement to indicate that the assignment must be confidential or go to arbitration. Attractive because it might be the only way to compel completion of the work or compliance with the agreement.
- B. *The agreement will not be enforceable and is void.* Attractive because the terms of the agreement might be all but impossible to enforce because the new owner was not a party to the original agreement. However, unenforceability is decided by arbitration or a court of law.
- C. Correct. *The consultant is bound by the agreement.* The agreement states, "Neither party shall assign or otherwise transfer any rights or obligations under this agreement without the written consent of the other party." Not too obvious because the consultant no longer operates the business, but the consultant is not released from the agreement without the client's written consent. -. Correct
- D. *The obligations will pass to the new owner.* Incorrect because the consultant may not transfer rights or obligations without the client's written consent. Attractive because the agreement states, "this agreement shall be binding upon and shall inure to the benefit of the parties' respective heirs,

successors, attorneys, and permitted assignees," meaning that the terms of the agreement may be transferred, but the transfer is subject to the written consent of the other party.

- E. *You must renegotiate the agreement with the new owner.* You may wish to use the new owner in a

consulting capacity, but there is no obligation under this agreement to do so.

## Locating Information

### Answer to Level 3 Sample Item

1. The graduations are by 10s not 20s. Attractive because if graduations were by 20s, the pressure would be about 30 (between 20 and 40).
2. The graduations are by 10s and therefore the major line between 20 and 40 would be 30; The needle, though, lies between this graduation (30) and 40, so it reads 35 as best choice. **...\_correct**
3. Attractive because needle is closer to 40 than 20, but 35 is best choice.
4. Attractive to those who read 40 and then increase counterclockwise by 5 to get 45.
5. The needle is to be read using the pointed end. Attractive because the short, wide end of the needle points to 100.

### Answer to Level 4 Sample Item

1. You are to launder the shirt rather than dry clean, and it should not be folded.
2. You are to launder the shirt rather than dry clean.
3. The shirt should be starched lightly.
4. The shirt is to be laundered and then starched (light) and on a hanger. **... Correct**
5. The shirt should be starched lightly not medium and it should not be folded.

### Answer to Level 5 Sample Item

1. First, locate the 20 degree line on the "Relative Wind Angle" scale. Move along this line to halfway between the 40- and SO-knot arc lines. This is the 45-knot wind speed point. From this point, drop straight down to the "Crosswind Component" axis to a point halfway between 10 and 20. This is the crosswind component, 15 knots. **... Correct**
2. The intersection between 20 on the Crosswind Component axis and 45 on the "Headwind Component" axis falls on the 25 degree line for relative wind angle, but this does not account for the value of 20 degrees for relative wind angle.
3. 43 knots is the headwind component for a wind speed of 45 knots at a 20 degree angle, but the question asks for the crosswind component, not the headwind component.



4. This reflects an incorrect reading of the chart based on following the 20 value from the "Headwind Component" axis down to the crosswind component value of 45.
5. The intersection of 20 on the "Headwind Component" axis and 45 on the "Crosswind Component" axis is near the 65-degree line for relative wind angle, but the question asks for the crosswind component, not a wind angle value.

#### **Answer to Level 6 Sample Item**

1. The shrink-swell potential for silt loam is low (to moderate) at range 38-60", but you are interested in 30".
2. The shrink-swell potential for silt loam is low to moderate at range 38-60", but you are interested in 30".
3. The shrink-swell potential for silt loam at 0-3811 is moderate, so the shrink-swell potential for 3011 is moderate. "" **Correct**
4. The shrink-swell potential for silt loam at 30" is moderate, but does not range to high.
5. The shrink-swell potential for silt loam does not range to high.