

REx-PN[®]

Webinar



Future Enhancement

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Objectives

- Discuss future enhancement to the REx-PN Exam

Where it all began



Background

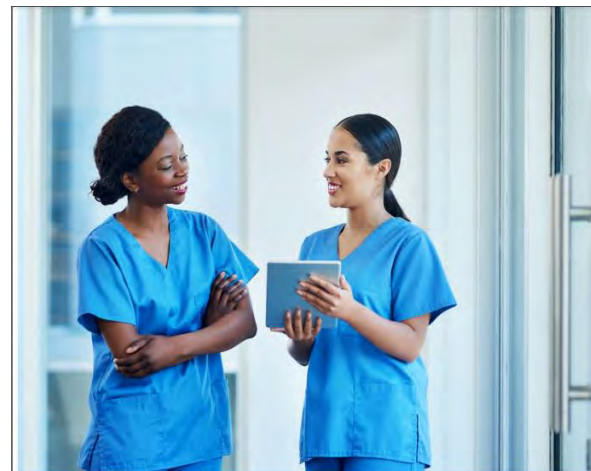
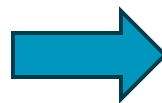


NCSBN RESEARCH BRIEF
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2019 REX-PN® Practice Analysis



REx-PN
Webinar



Effective January 2022

REx-PN®

Test Plan for the Regulatory Exam – Practical Nurse



REx-PN
Regulatory Exam – Practical Nurse

REx-PN Scoring

- Many items on the REx-PN are multiple-choice, however other item formats exist.
- Items are scored as either correct or incorrect. There is no partial credit.

Future of REx-PN



Polytomous scoring or partial credit where applicable.

What does this mean?

- Increased scoring precision
- Partial credit for what a candidate knows



Scenario 3: Run-Out-Of-Time Rule (R.O.O.T)

If a candidate runs out of time before reaching the maximum number of items and the computer has not determined with 95% certainty whether the candidate has passed or failed, an alternate criterion is used.

- If the candidate has not answered the minimum number of required items (90 operational items), the candidate automatically fails.
- If at least the minimum number of required items were answered, the computer looks at the final ability estimate:
 - If the final ability estimate is above the passing standard, the candidate passes
 - If the final ability estimate is at or below the passing standard, the candidate fails.

Types of Items on the REX-PN®

During the administration of the REX-PN, candidates will be required to respond to items in a variety of

Scoring Items

Many items on the REX-PN are multiple-choice, however other item formats exist. Items are scored as either correct or incorrect. There is no partial credit. For updated information on the administration of the examination, access the NCSBN website at rexpn.com.

The REX-PN Examination Committee (PNEC) re-evaluates the passing standard once every five years. The criterion that the PNEC uses to set the standard is the minimum level of ability required for safe and effective entry-level nursing practice. To assist the PNEC in making this decision, they are provided information on the results of a standard setting exercise performed by a panel of experts with the assistance of psychometricians.

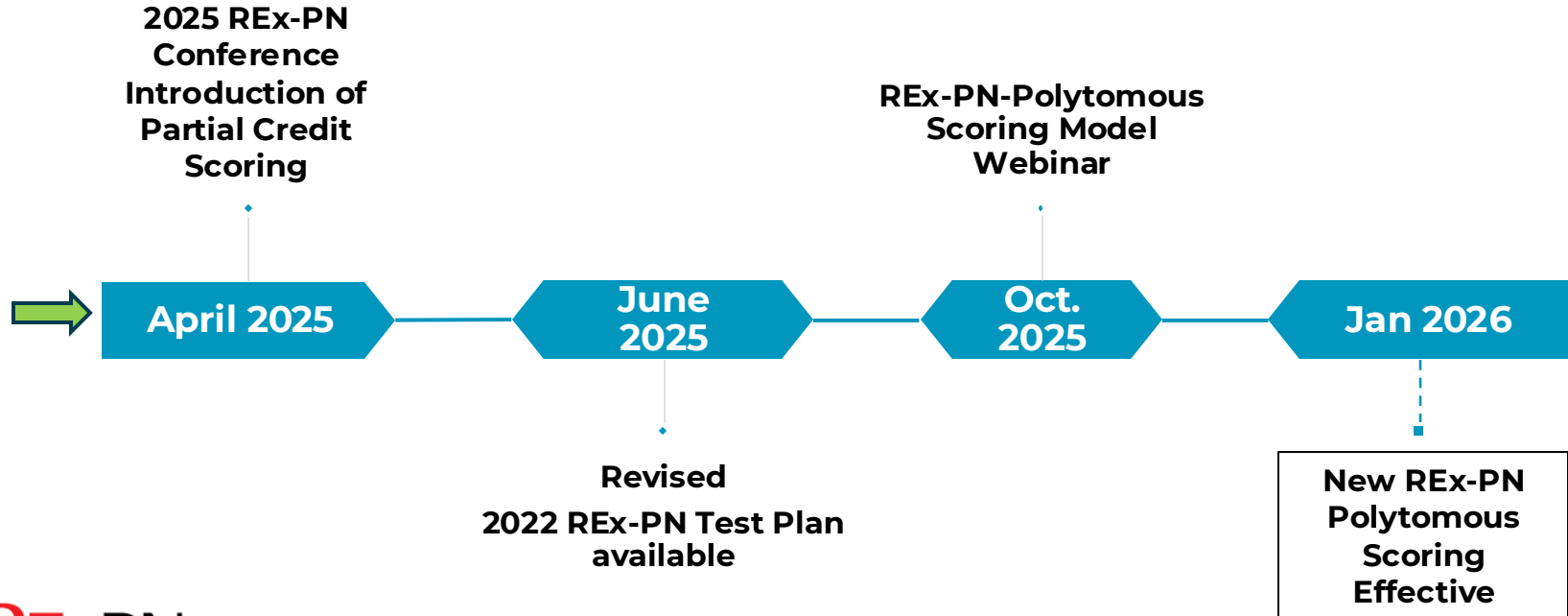
Once the passing standard is set, it is applied uniformly to every examination according to the procedures laid out in the Scoring the REX-PN section. To pass the REX-PN Exam, a candidate must perform **above** the passing standard. There is no fixed percentage of candidates that pass or fail each examination.

Similar Items

Occasionally, a candidate may receive an item that seems to be very similar to one received earlier in the examination. This may happen for a variety of reasons. Items may contain content pertaining to similar symptoms, diseases, or disorders, yet address different phases of the nursing process. Alternatively, a pretest (unscored) item may contain content similar to an operational (scored) item. Candidates should not assume they received a second item similar in content to a previously administered item because the candidate answered the first one incorrectly. The candidate is instructed to always select the answer believed to be correct for each item administered.

Revised 2022 REx-PN Test Plan

REx-PN Polytomous Scoring Timeline



Multi-Point Scoring in Detail...

REx-PN
Webinar



Future Enhancements: Polytomous Scoring

Joe Betts, PhD, Ed.S., MMIS

Director, Measurement & Testing



Overview

- Current computerized-adaptive test(CAT) using right/wrong (dichotomous) scoring
- Provide overview of extended scoring using partial credit (polytomous) scoring

Current Dichotomous Scoring

- Items scored as right/wrong $\rightarrow \{1, 0\}$

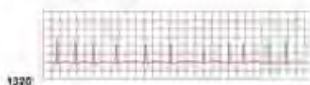
MC: Dichotomous Scoring

The nurse in the emergency department (ED) is caring for a 67-year-old male client who is experiencing chest pain.

Nurses' Notes

Diagnostic Results

Electrocardiogram (ECG)



The nurse is reviewing the client's Diagnostic Results.

➤ The client is most likely experiencing

- ☐ atrial fibrillation
- ☐ atrial flutter
- ☐ a non-ST-segmental myocardial infarction
- ☒ an exacerbation of long-term heart failure

Multiple Choice → all right/all wrong = {1, 0}

Multiple Response (MR) SATA

The nurse is caring for a 49-year-old client in the cardiology clinic.

Nurses' Notes

0730: Client arrived at the clinic with increasing chest pain that started approximately 24 hours ago. Client describes the pain as continuous pressure with a stabbing sensation that radiates down his left arm and states that he is now "having trouble taking a deep breath and feels nauseous." Client rates his pain 9/10 on the numerical scale at this time. Home medications include an antihypertensive and an oral antidiabetic agent. Client also reports that he takes a daily aspirin, which was last taken a few weeks ago, and sublingual nitroglycerin that he hasn't taken in several years. Client has a history of diabetes mellitus type 2, hypertension and anxiety. Surgical history includes 2 stents placed 4 years ago. Client states that his blood glucose on his home monitor was 94 mg/dL (5.17 mmol/L), blood pressure 156/111, and reports that his pulse was 112 when he checked it this morning.

➤ The nurse is documenting care for the client. Which of the following should the nurse include? Select all that apply.

- ☒ Aspirin was given to the client with a glass of water.
- ☐ 12-lead electrocardiogram (ECG) obtained; physician notified.
- ☒ Peripheral venous access device (VAD) placed in right antecubital vein. Flushes easily, no swelling or drainage noted to insertion site.
- ☐ Notified emergency services. Advised family member to stay with client in the exam room and to notify someone if there are any changes.
- ☒ Client is receiving 100% oxygen via non-rebreather mask and has a pulse oximetry reading of 97%. Client states: "It feels easier to breathe with the oxygen in place."

There are 3 correct options

Must select ALL to get 1 point
Otherwise, 0 points

* NOTE: The keys are just indicated for example!

End Exam

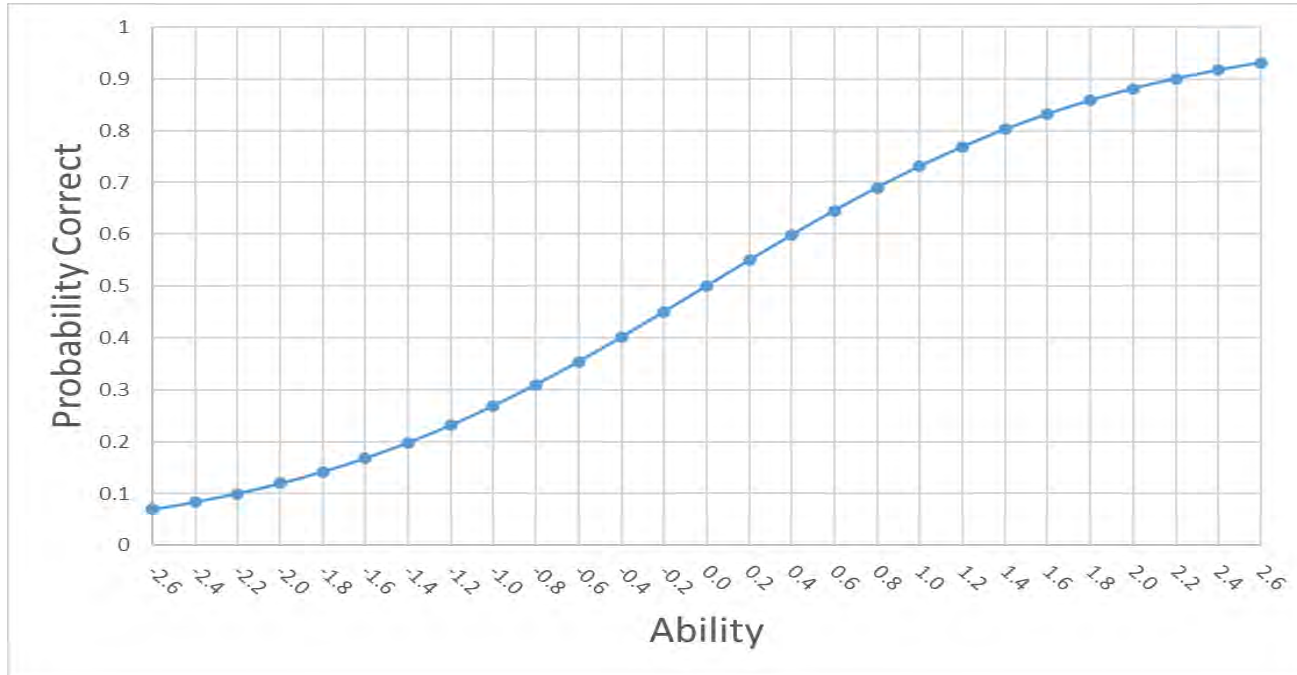
Previous Next

Translating Scores to REx-PN Scale

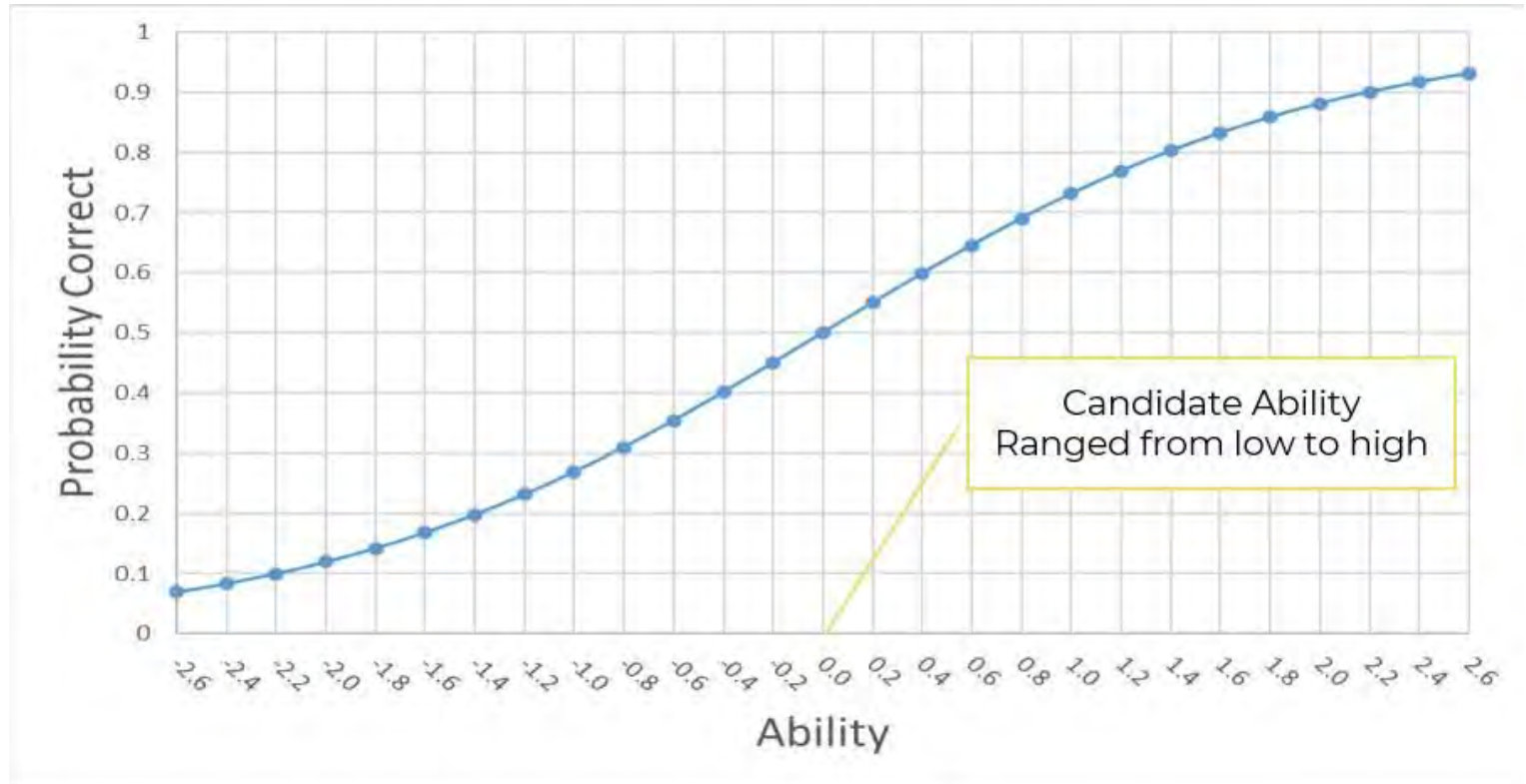
- Items scored as right/wrong $\rightarrow \{0, 1\}$
- Number correct score scaled to REx-PN score scale
 - Rasch model $\rightarrow$ puts persons and items on same scale

Rasch Model

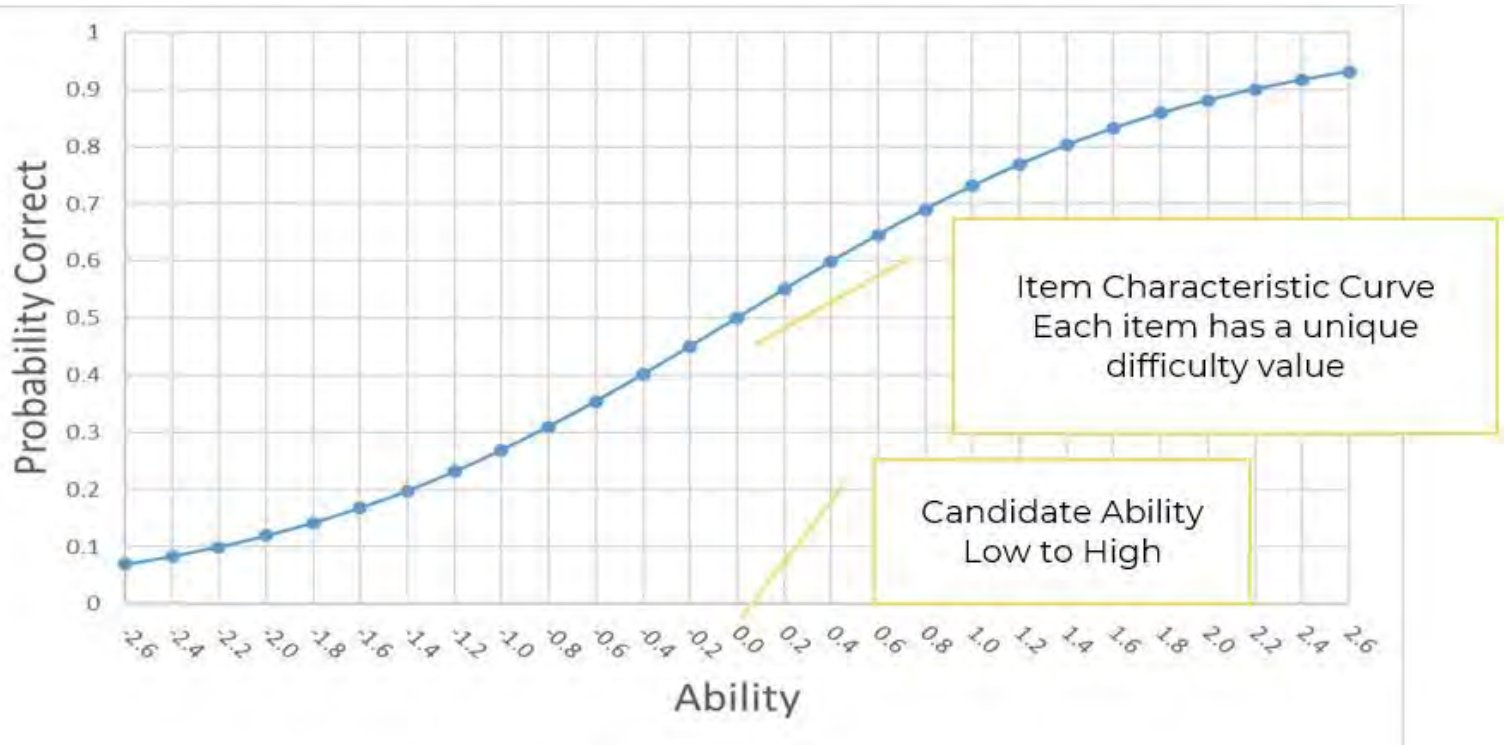
- Given any item difficulty value & a candidate ability
→ a probability of answering the item correctly



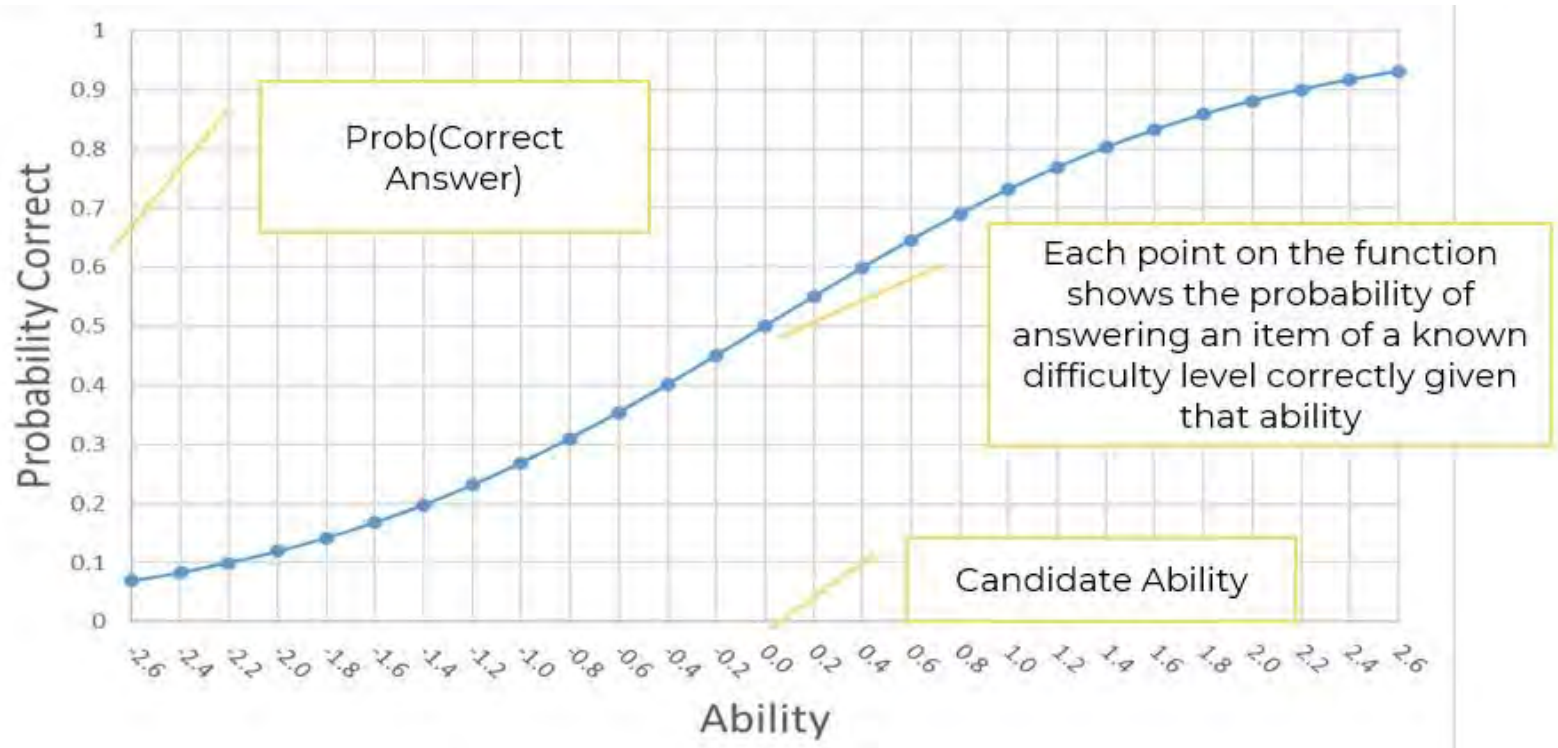
Rasch Model



Rasch Model



Rasch Model



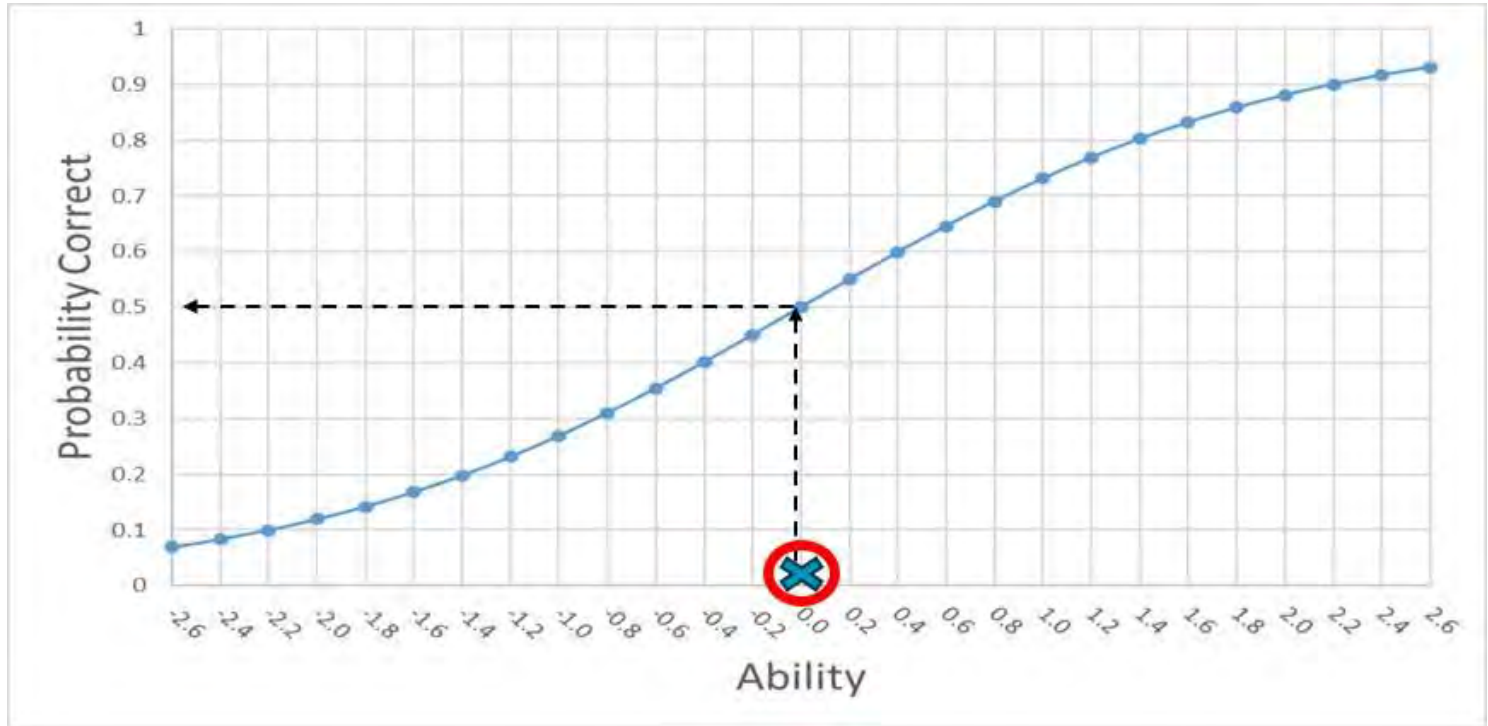
Item Difficulty Fixed ($b = 0$)



Note: $P(X=0) = 1 - P(X=1)$

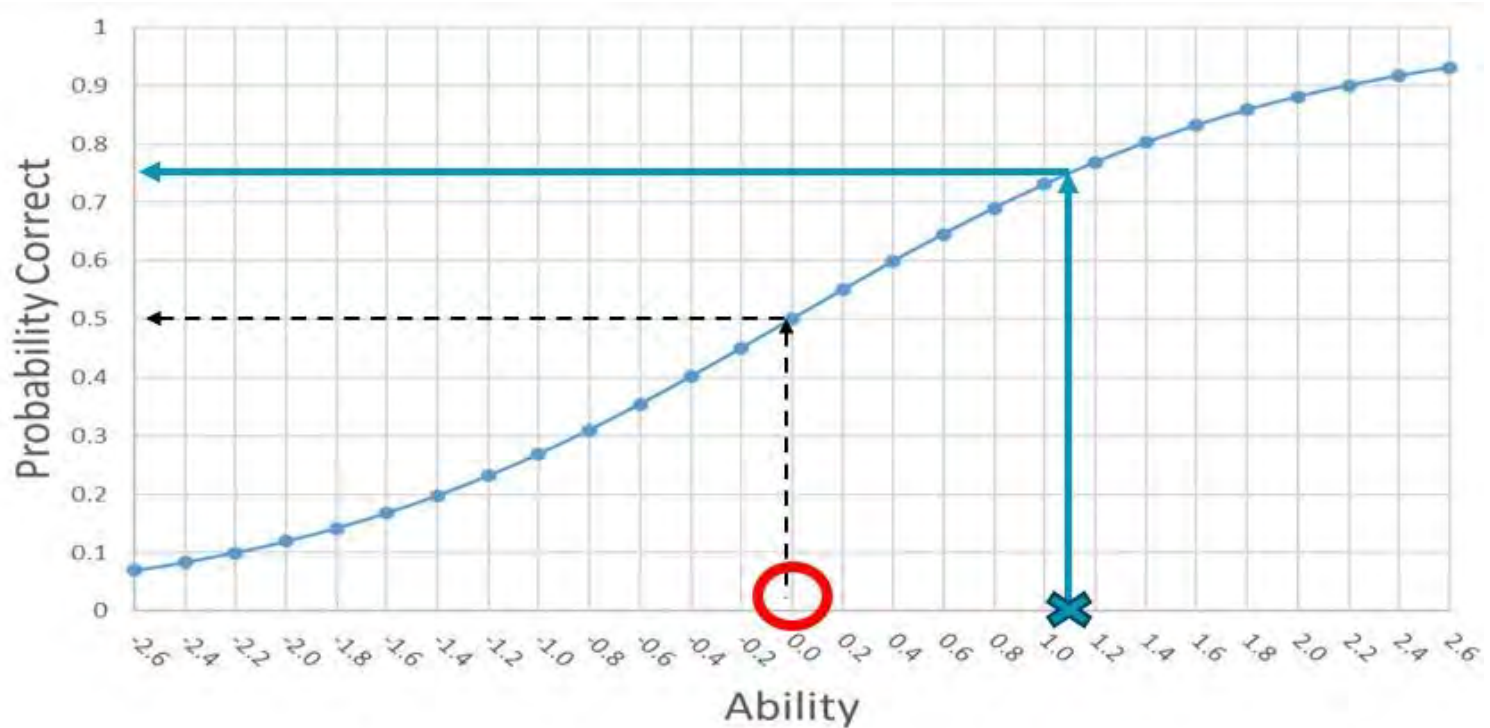
Item Difficulty Fixed ($b = 0$)

- Ability = 0 $\rightarrow$ $P(\text{correct}) = 50\%$



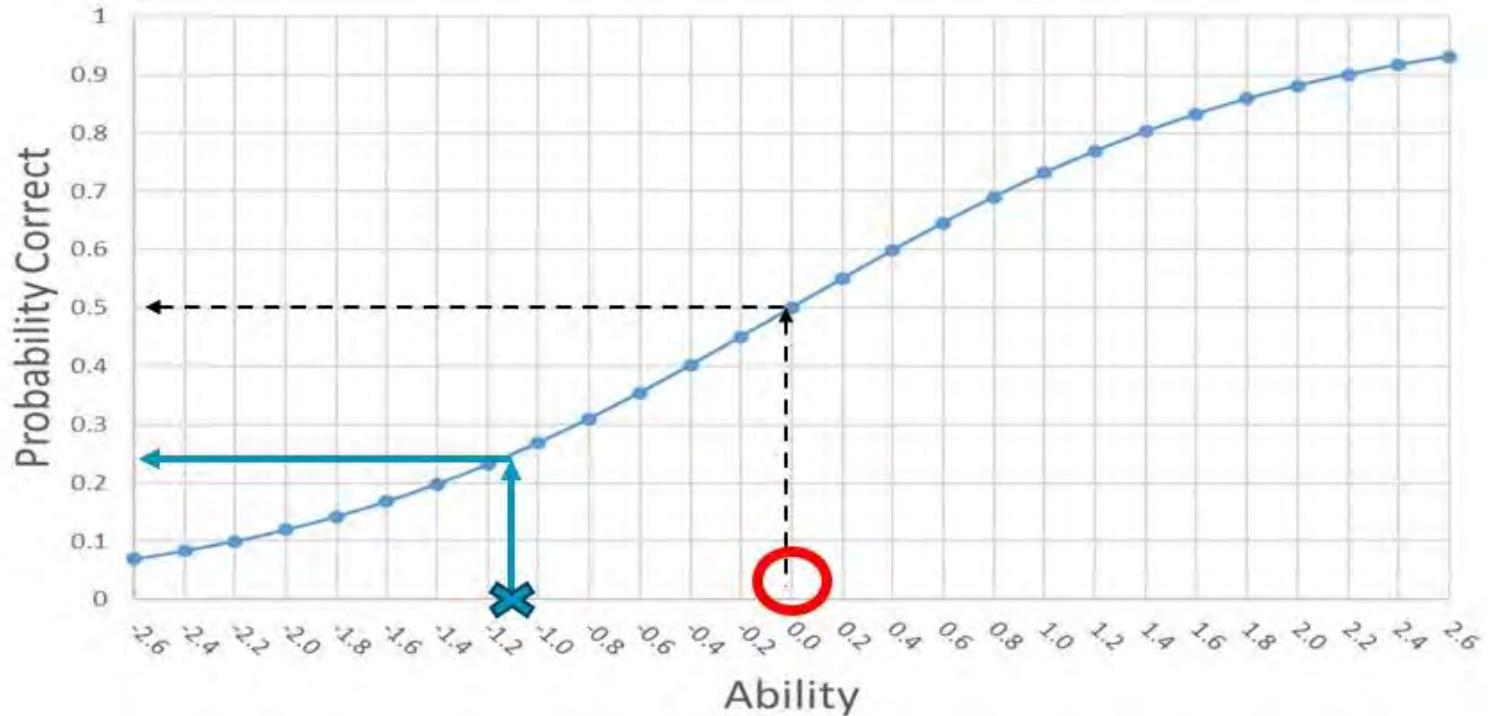
Item Difficulty Fixed ($b = 0$)

- Ability = 1.1 $\rightarrow$ $P(\text{correct}) = 75\%$



Item Difficulty Fixed ($b = 0$)

- Ability = -1.1 $\rightarrow$ $P(\text{correct}) = 25\%$



Translating Scores to REx-PN Scale

- Items scored as right/wrong $\rightarrow \{0, 1\}$
- Number correct score scaled to REx-PN score scale
 - Rasch model $\rightarrow$ puts persons and items on same scale
- A common scale is what underlies CAT
 - Items of fixed difficulty can be selected optimally for each candidate given their ability

Partial Credit Scoring - Overview

- Partial Credit Model (PCM)
 - Mathematical extension of Rasch Model
 - Allows items to be scored for partial credit instead of all or nothing
- Polytomous scoring
 - Multiple score points $\{0, 1, 2, \dots, \text{max}\}$ instead of only $\{0, 1\}$

Example: MR SATA

The nurse is caring for a 44-year-old client in the cardiology clinic.

Nurses' Notes

0730: Client arrived at the clinic with increasing chest pain that started approximately 24 hours ago. Client describes the pain as continuous pressure with a stabbing sensation that radiates down his left arm and states that he is now "having trouble taking a deep breath and feels nauseous." Client rates his pain 9/10 on the numerical scale at this time. Home medications include an antihypertensive and an oral antidiabetic agent. Client also reports that he takes a daily aspirin, which was last taken a few weeks ago, and sublingual nitroglycerin that he hasn't taken in several years. Client has a history of diabetes mellitus type 2, hypertension and anxiety. Surgical history includes 2 stents placed 4 years ago. Client states that his blood glucose on his home monitor was 84 mg/dL (5.17 mmol/L), blood pressure 190/111, and reports that his pulse was 119 when he presented this morning.

The nurse is documenting care for the client. Which of the following should the nurse include? Select all that apply.

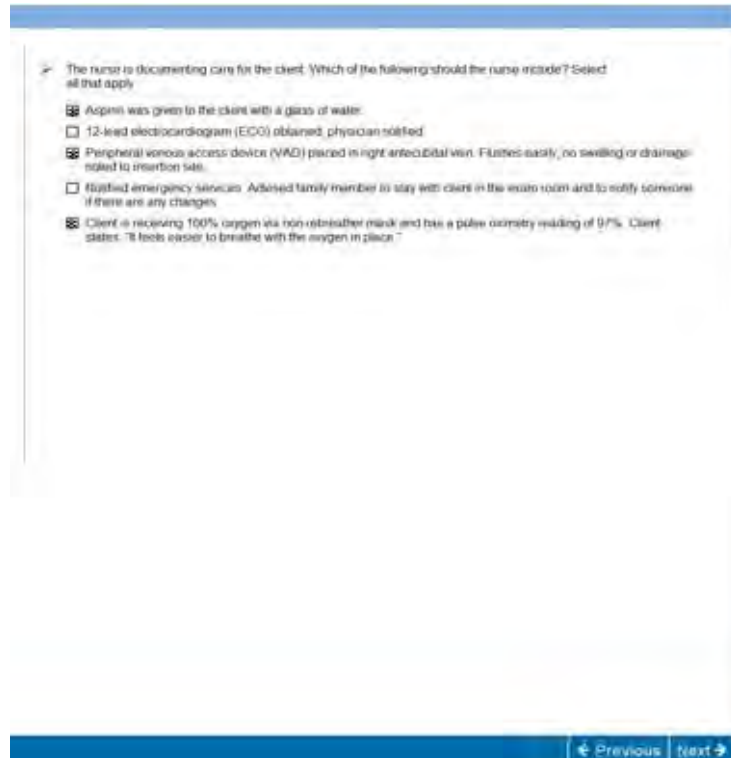
- ☒ Aspirin was given to the client with a glass of water.
- ☐ 12-lead electrocardiogram (ECG) observed; physician notified.
- ☒ Peripheral venous access device (VAD) placed in right antecubital vein. Flucties present; no swelling or drainage noted to insertion site.
- ☐ Notified emergency services. Advised family member to stay with client in the exam room and on-call if summoned if there are any changes.
- ☒ Client is receiving 100% oxygen via non-rebreather mask and has a pulse oximetry reading of 92%. Client states, "It feels easier to breathe with the oxygen in place."

Imagine 3 keys:
Dichotomous model = {0, 1}
Polytomous model = {0, 1, 2, 3}

Previous Next

Example Scoring: Plus/Minus

- Scored using +/-
 - Opportunity to over/under select
- Correct response = +1
- Incorrect response = -1
- Overall score = sum of all selected options
 - If less than 0, then 0



The nurse is documenting care for the client. Which of the following should the nurse include? Select all that apply.

- ☒ Acupress was given to the client with a glass of water.
- ☐ 12-lead electrocardiogram (ECG) obtained; physician notified.
- ☒ Peripheral venous access device (PVAD) placed in right antecubital vein. Flushed easily; no swelling or drainage noted at insertion site.
- ☐ Requested emergency services. Advised family member to stay with client in the exam room and to notify someone if there are any changes.
- ☒ Client is receiving 100% oxygen via non-rebreather mask and has a pulse oximetry reading of 97%. Client states, "It feels easier to breathe with the oxygen in place."

Previous Next

Example Scoring: Plus/Minus

- Scored using +/-
 - Opportunity to over/under select
- Correct response = +1
- Incorrect response = -1
- Overall score = sum of all selected options
 - If less than 0, then 0

➤ The nurse is documenting care for the client. Which of the following should the nurse include? Select all that apply.

- ☒ A. Aspen was given to the client with a glass of water.
- ☐ B. 12-lead electrocardiogram (ECG) obtained; physician notified.
- ☒ C. Peripheral venous access device (PVAD) placed in right antecubital vein. Flushed easily; no swelling or drainage noted at insertion site.
- ☐ D. Notified emergency services. Advised family member to stay with client in the exam room and to notify someone if there are any changes.
- ☒ E. Client is receiving 100% oxygen via non-rebreather mask and has a pulse oximetry reading of 97%. Client states, "It feels easier to breathe with the oxygen in place."

Select = {A, B, C}

Score = {+1, -1, +1}

Overall = 2 - 1 = 1

Item score = 1

Example Scoring: Plus/Minus

- Scored using +/-
 - Opportunity to over/under select
- Correct response = +1
- Incorrect response = -1
- Overall score = sum of all selected options
 - If less than 0, then 0

The nurse is documenting care for the client. Which of the following should the nurse include? Select all that apply.

- ☒ Acpain was given to the client with a glass of water.
- ☐ 12-lead electrocardiogram (ECG) obtained; physician notified.
- ☒ Peripheral venous access device (PVAD) placed in right antecubital vein. Flushes easily; no swelling or drainage noted at insertion site.
- ☐ Notified emergency services. Advised family member to stay with client in the exam room and to notify someone if there are any changes.
- ☒ Client is receiving 100% oxygen via non-rebreather mask and has a pulse oximetry reading of 97%. Client states: "It feels easier to breathe with the oxygen in place."

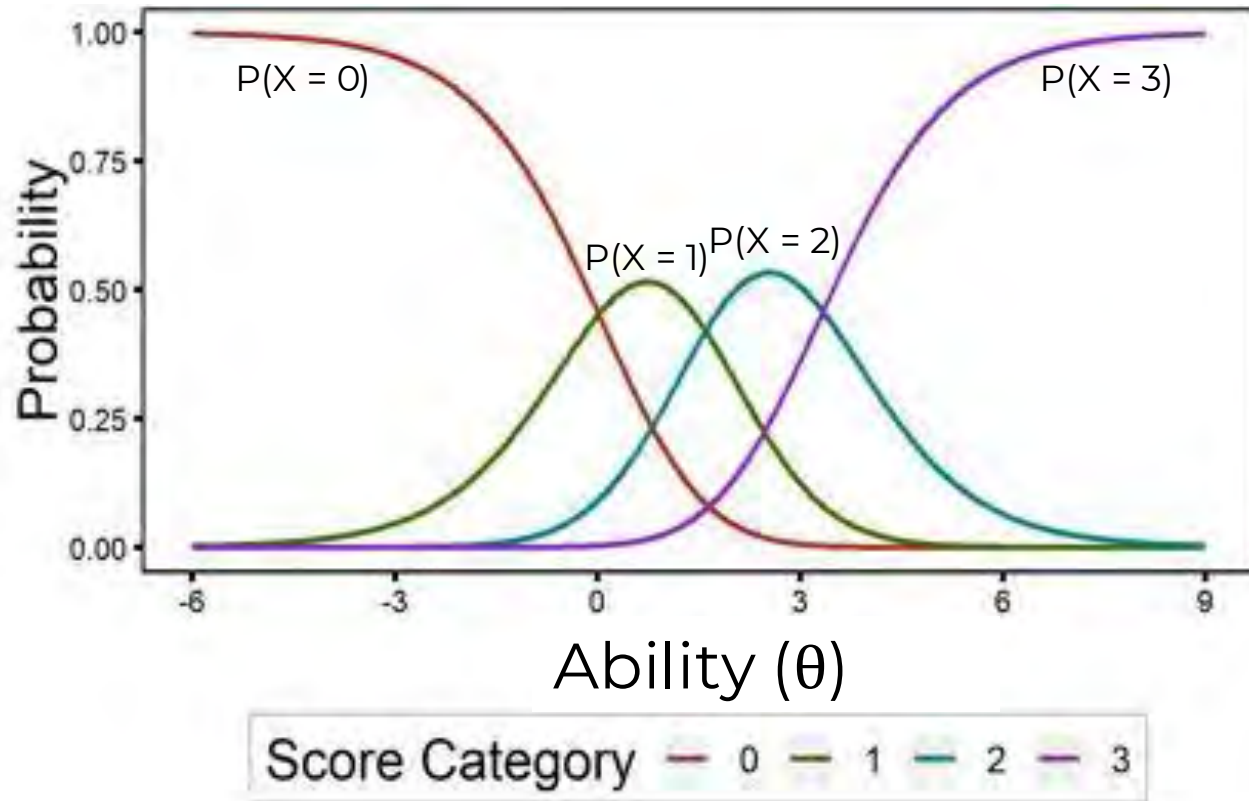
Select = {B, C, D}

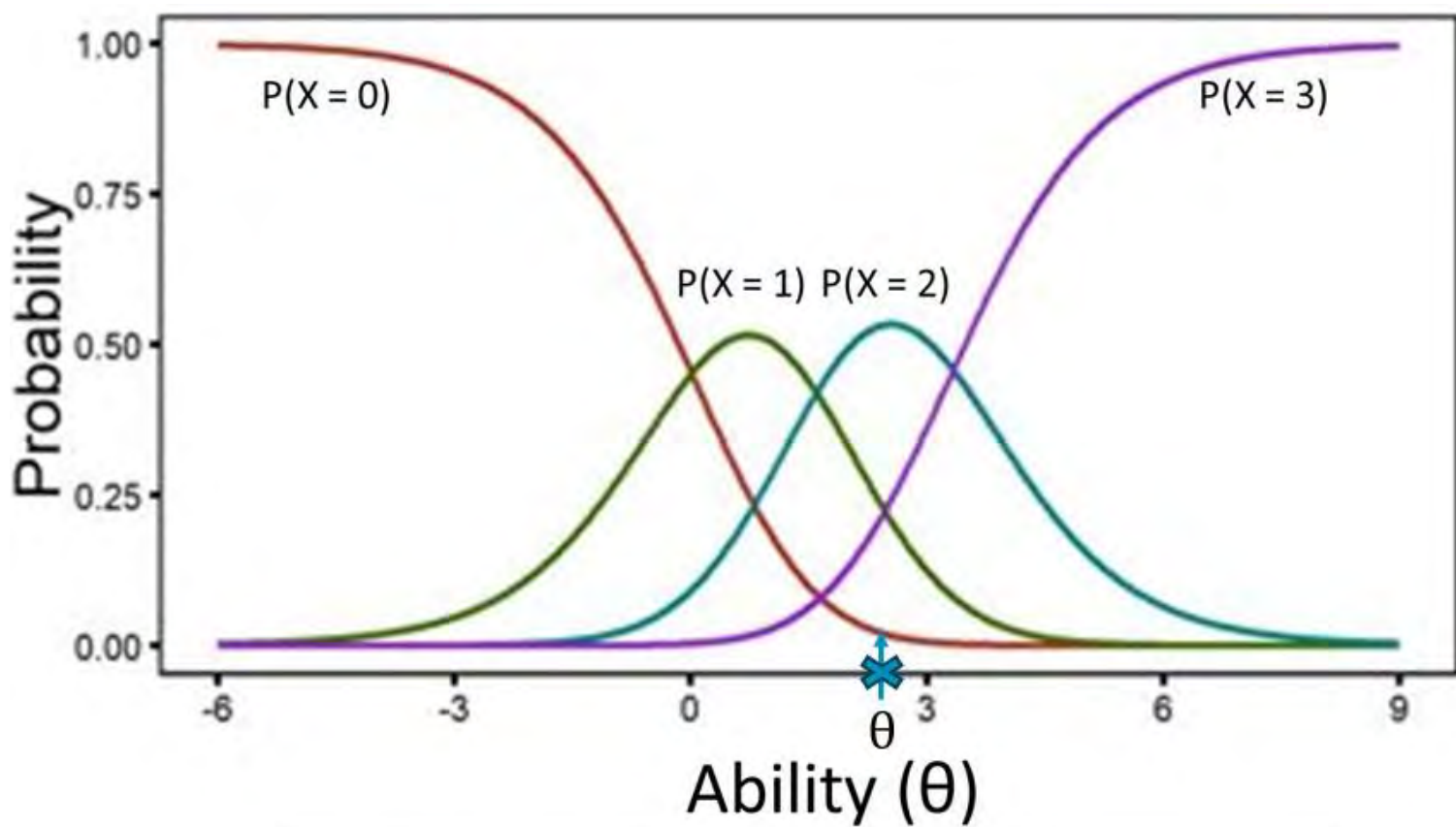
Score = {-1, +1, -1}

Overall = 1 - 2 = -1

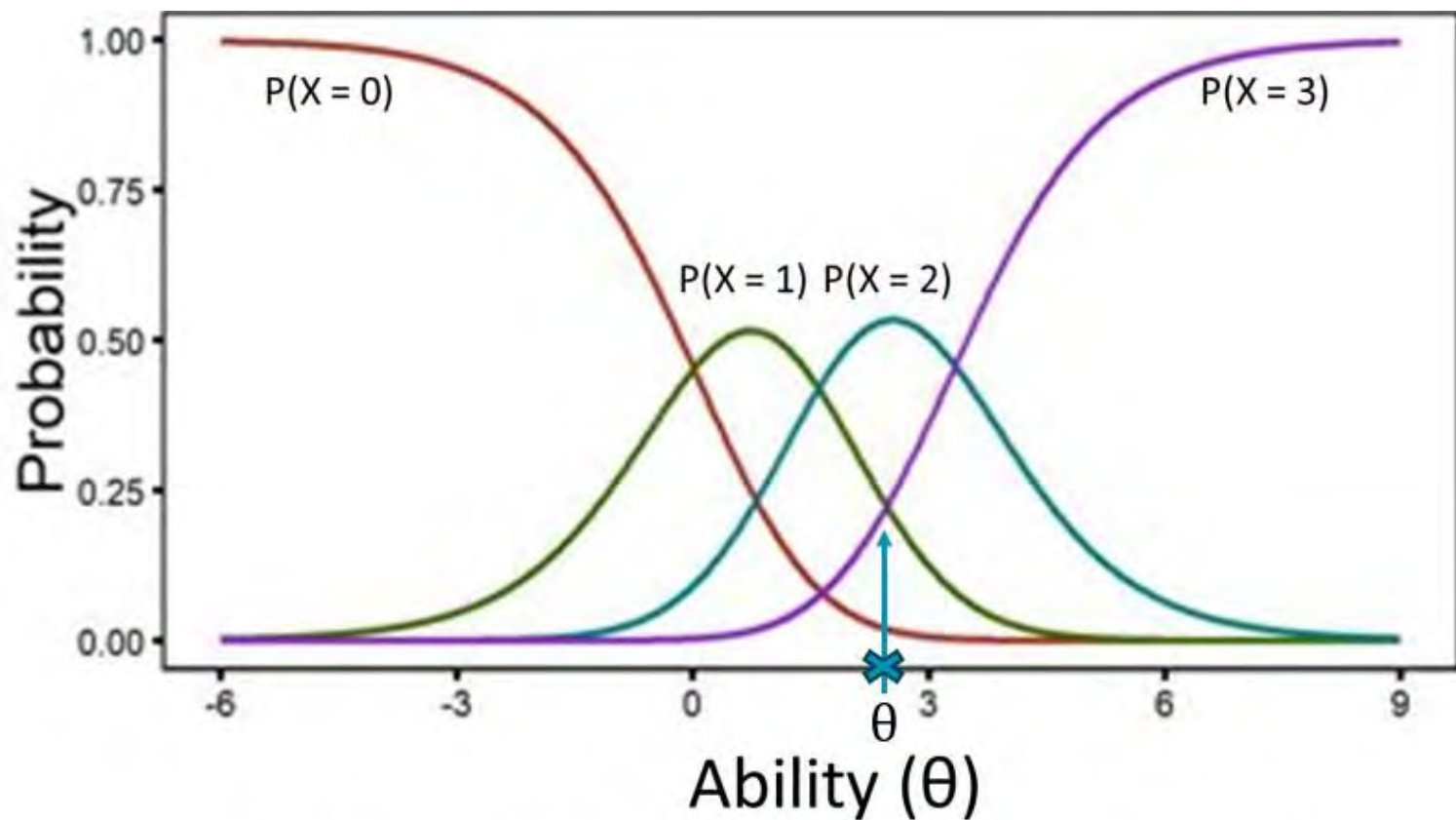
Item score = 0

Polytomous model

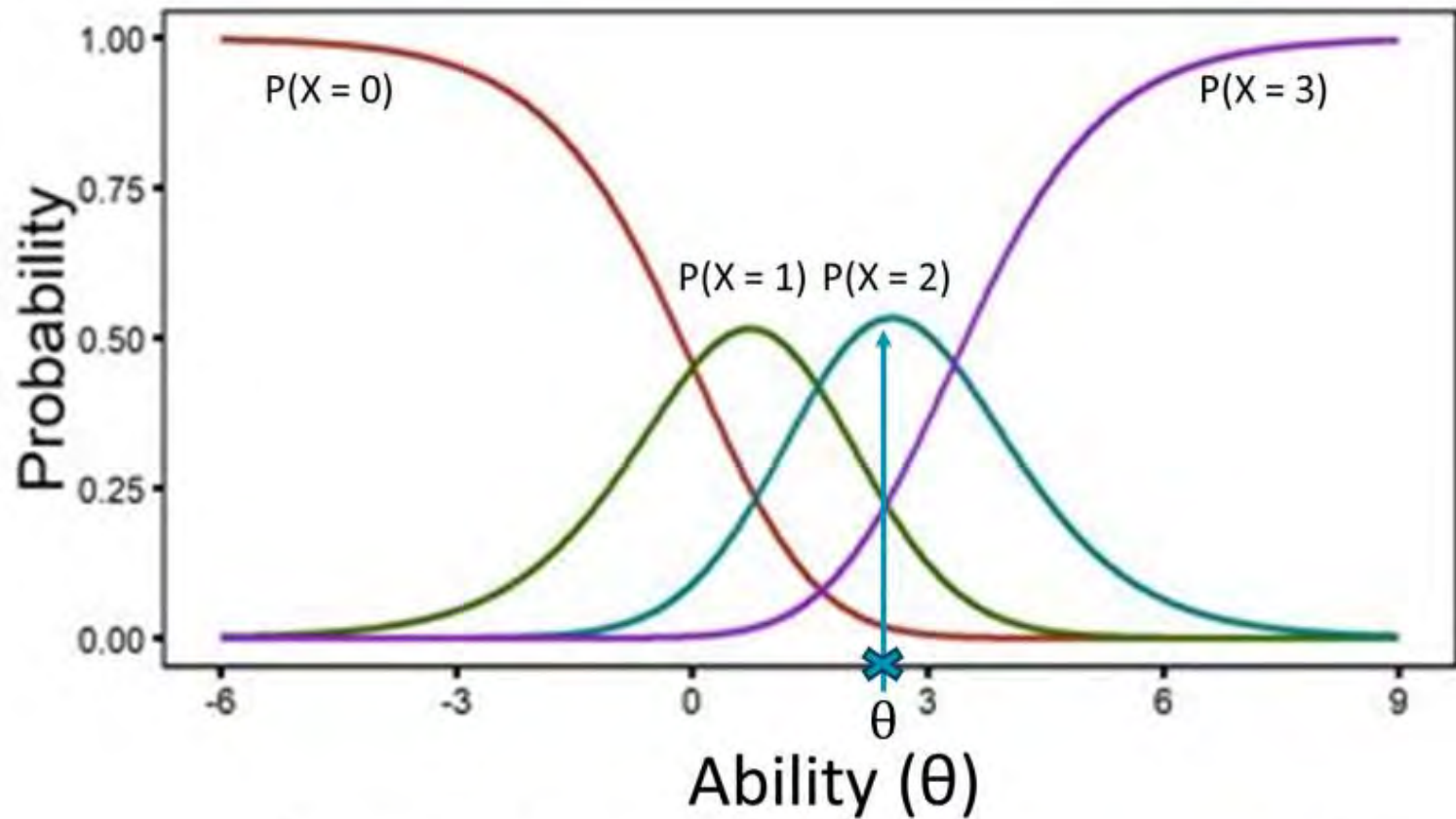




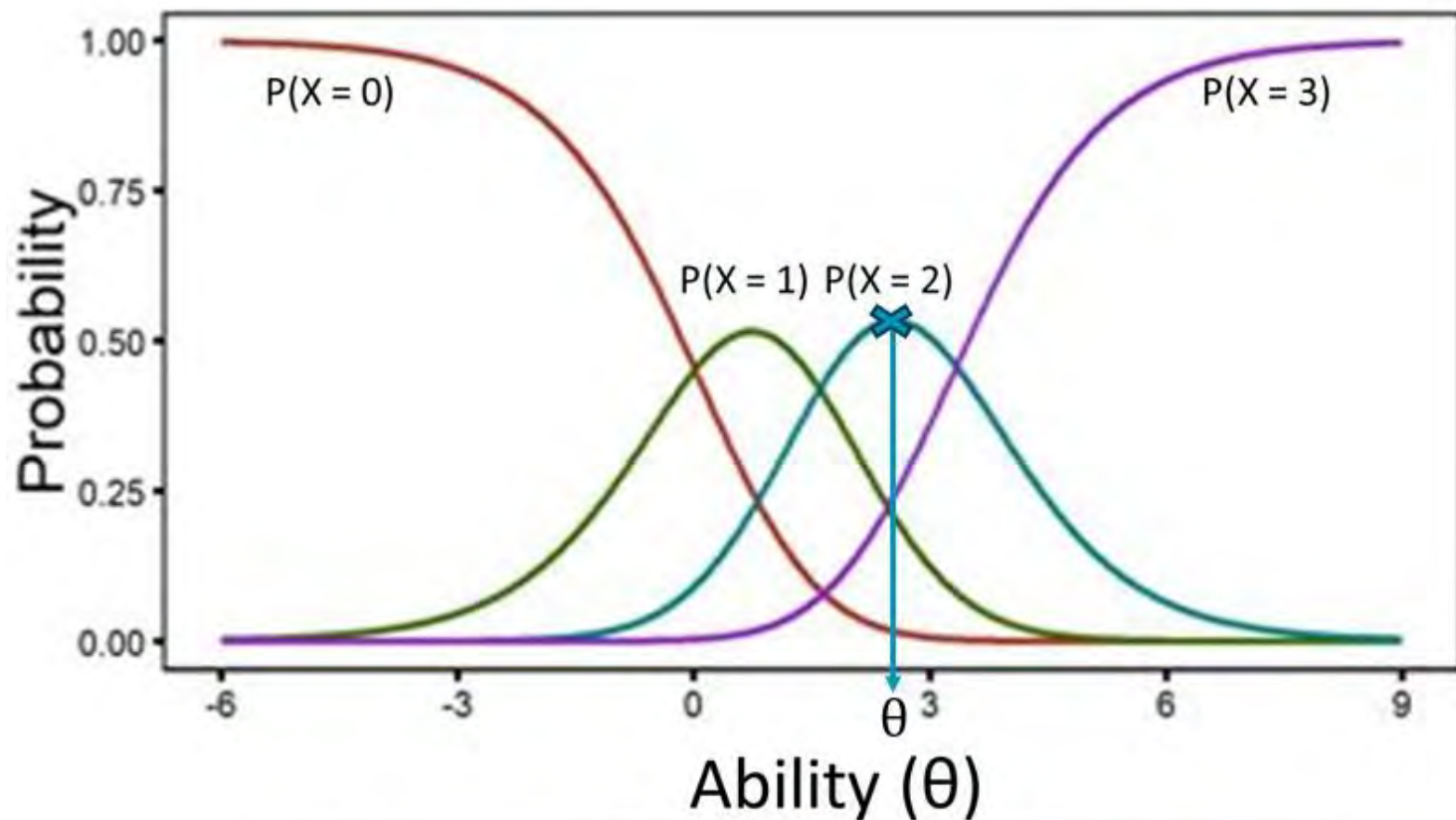
Score Category — 0 — 1 — 2 — 3



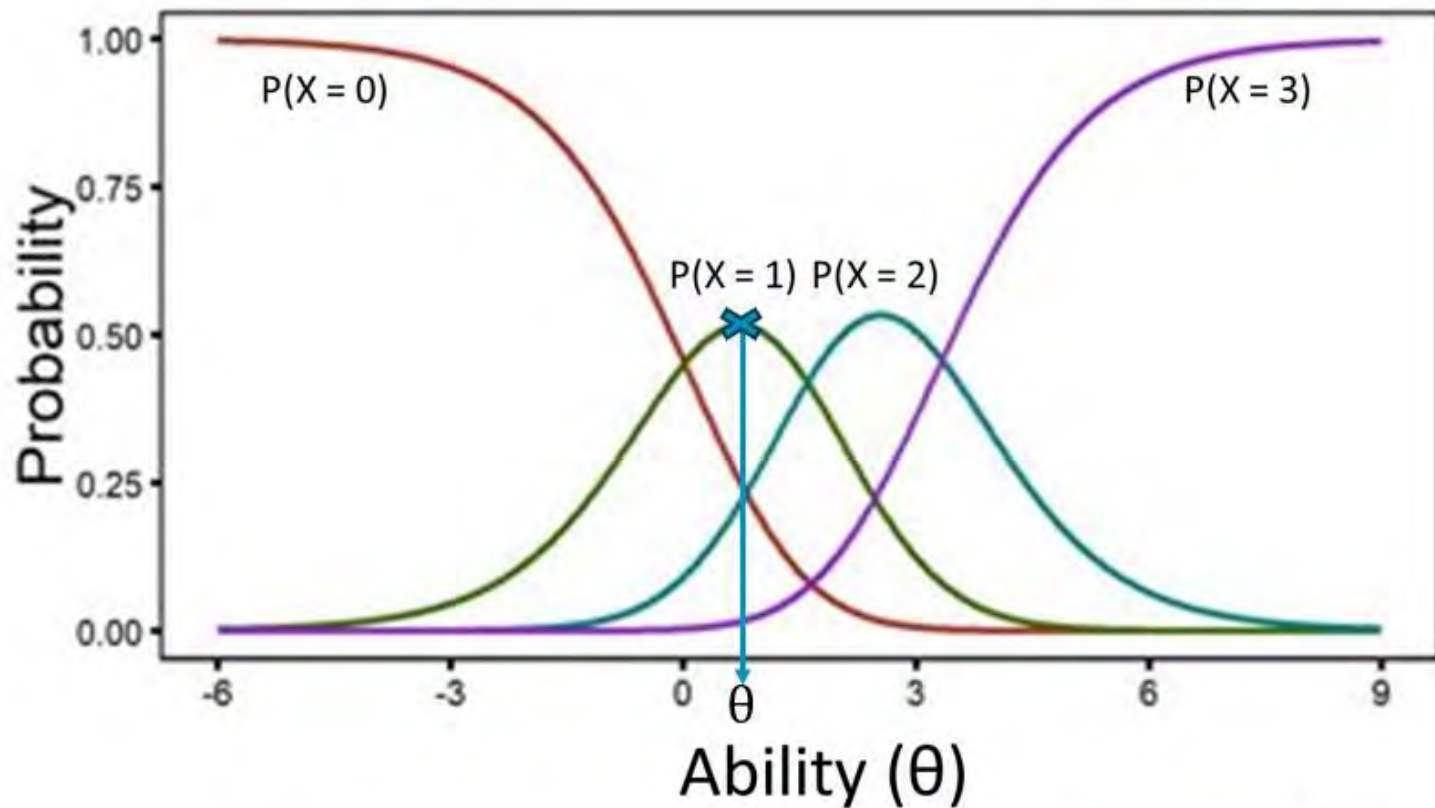
Score Category — 0 — 1 — 2 — 3



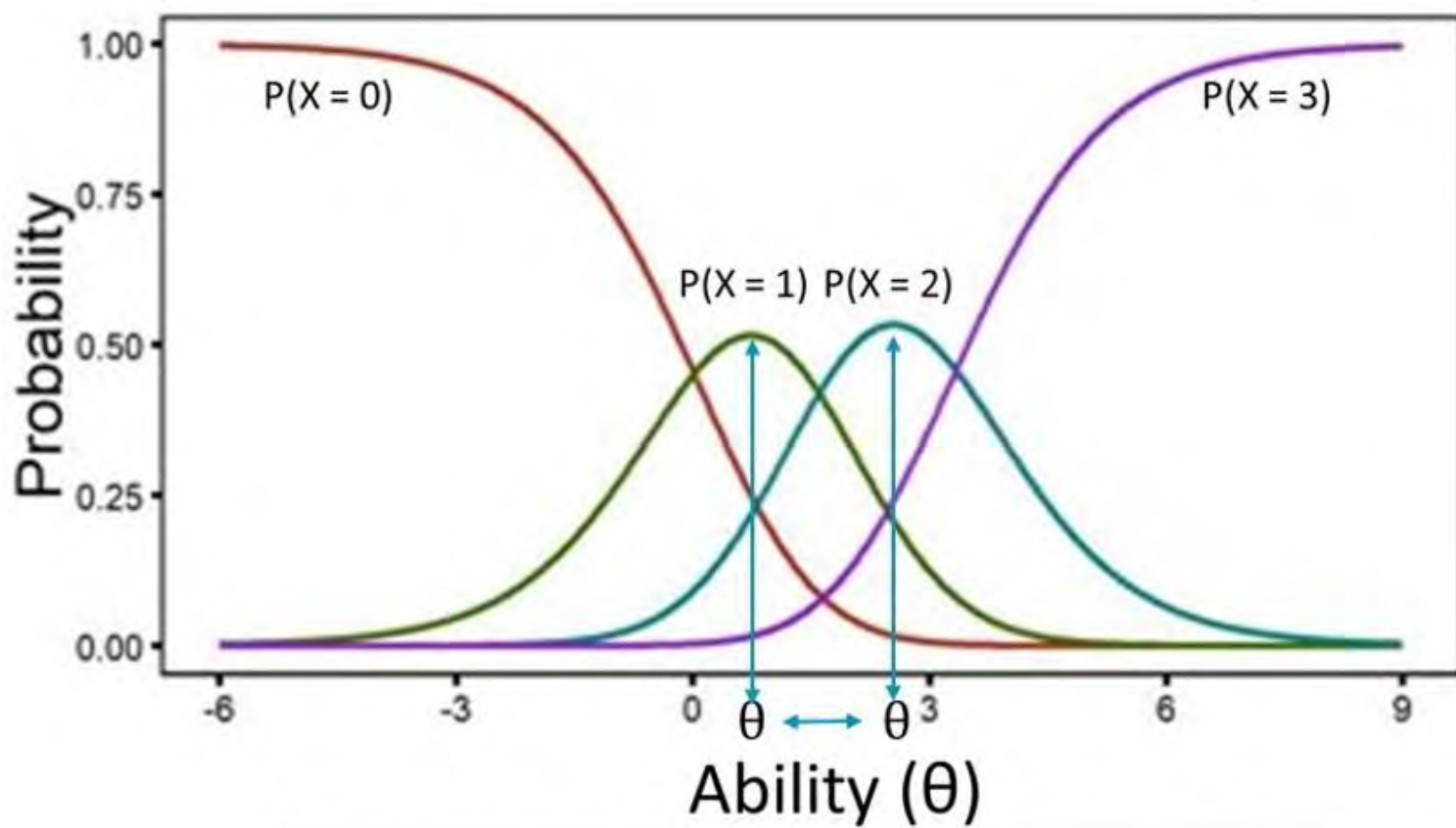
Score Category — 0 — 1 — 2 — 3

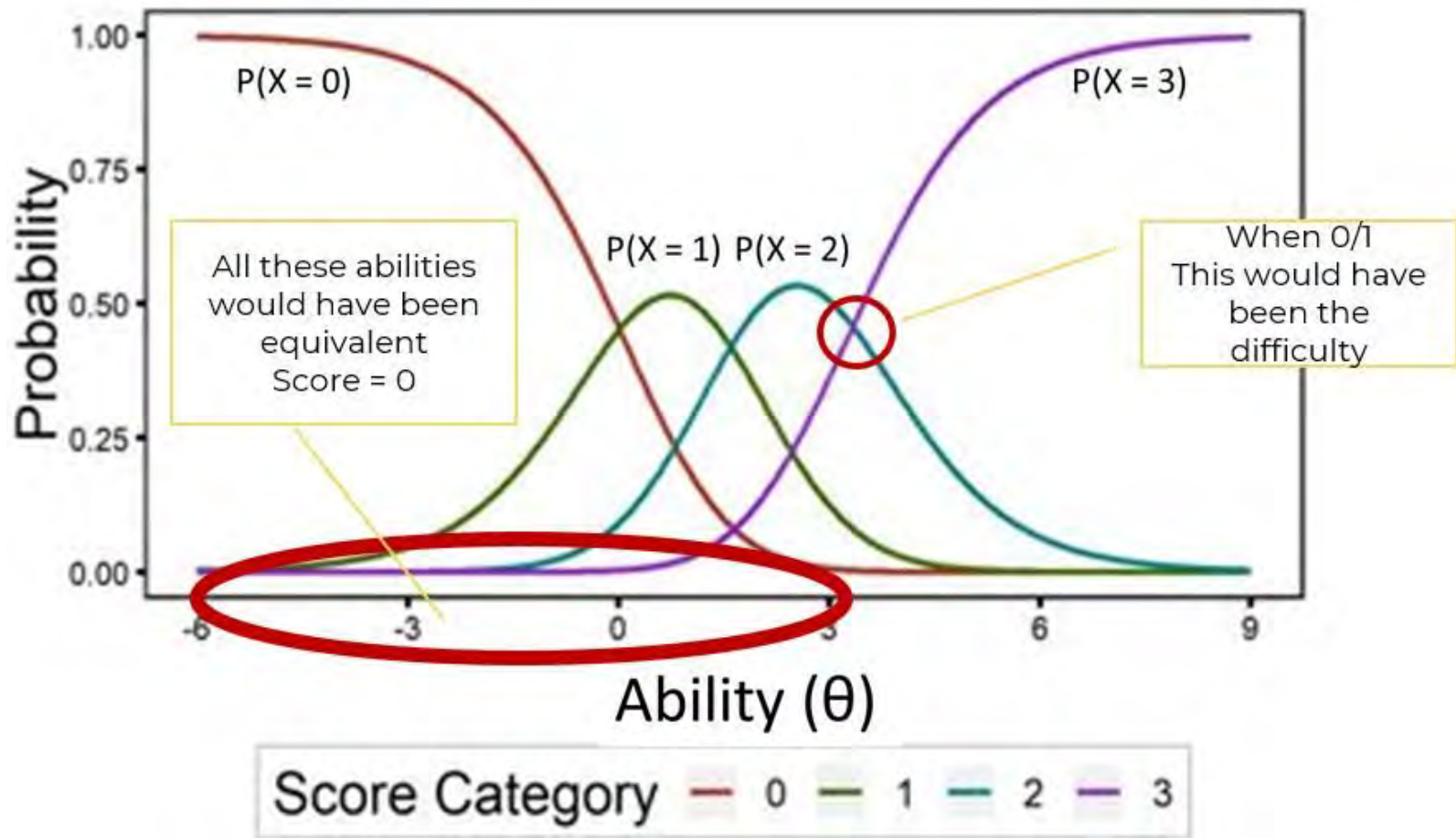


Score Category — 0 — 1 — 2 — 3



Score Category — 0 — 1 — 2 — 3





Conclusion

- The Partial Credit Model is an extension of the current Rasch model
 - Candidates will get partial credit on MR SATA
 - Continue to use the current REx-PN score scale
- Polytomous items provide more information
 - Rather than only right/wrong, information is garnered from multiple score categories
 - More information reduces measurement error
 - Less error means better decision making

Thank You

For Additional Questions
Email us at:

customerexperience@ncsbn.org

Be sure to review the [2022 REx PN Test Plan](#) scoring section