

PRACTICE EXAM 7

1. All of the following are components that may appear in a written spectacle prescription EXCEPT:
 - A. The lens material's Abbe value
 - B. The sphere power
 - C. The cylinder axis
 - D. The add power

2. Which of the following is the LEAST appropriate first action when a patient hands you an Rx with a cylinder power but no axis listed?
 - A. Recognize the prescription as incomplete
 - B. Set the work aside pending clarification
 - C. Assume an axis of 180 and proceed to order
 - D. Contact the prescriber to verify the axis

3. A patient's Rx reads $-4.00 -2.00 \times 180$. Which statement about the power in the two principal meridians is correct?
 - A. Both meridians carry -6.00 D
 - B. Both meridians carry -4.00 D
 - C. The 180 meridian carries -4.00 D and the 090 carries -6.00 D
 - D. The 180 meridian carries -6.00 D and the 090 carries -4.00 D

4. Which is NOT a valid step in transposing a prescription?
 - A. Combining the sphere with the cylinder algebraically
 - B. Changing the sphere by exactly half the axis value

- C. Reversing the sign of the cylinder
- D. Rotating the axis 90 degrees

5. A patient wants the thinnest lens for a strong minus Rx. Which is the MOST appropriate recommendation?

- A. The lowest-index material available
- B. A high-index material in a smaller, well-centered frame
- C. Crown glass in an oversized frame
- D. The widest possible bridge with standard plastic

6. Which of the following does NOT increase as a minus lens's power increases?

- A. The edge thickness
- B. The induced prism at a fixed off-center point
- C. The minifying effect on the eyes
- D. The center thickness

7. A patient looks 10 mm below the OC of a +3.00 D lens. Which statement about the induced prism is correct?

- A. It is 30.0Δ because power times millimeters is used
- B. It is 0.3Δ because millimeters are used directly
- C. It is 3.0Δ base down for a plus lens viewed below center
- D. It is 3.0Δ base up for a plus lens viewed below center

8. Which lens material is the MOST appropriate choice for a child's everyday eyewear?

- A. Polycarbonate

- B. Crown glass
- C. Untempered glass
- D. The thinnest ultra-high index

9. Which statement about the Abbe value is correct?

- A. A higher Abbe value indicates more chromatic aberration
- B. Abbe value rises as index of refraction rises
- C. A higher Abbe value indicates less chromatic aberration
- D. Abbe value measures scratch resistance

10. A frame is marked 52 □ 18 and the patient's PD is 64 mm. Which statement is correct?

- A. The frame PD is 64 mm
- B. No decentration is needed
- C. The decentration is 8 mm outward per lens
- D. The frame PD is 70 mm and 3 mm of inward decentration per lens is needed

11. Which is NOT a behavior of light relevant to ophthalmic lenses?

- A. Photosynthesis
- B. Refraction
- C. Reflection
- D. Dispersion

12. A patient's far point is at 0.5 m uncorrected, with clear near vision. Which is the MOST accurate interpretation?

- A. The patient is myopic, about -2.00 D

- B. The patient is hyperopic, about +2.00 D
- C. The patient is emmetropic
- D. The patient is presbyopic only

13. Which statement about the optical center and major reference point is correct?

- A. They never coincide
- B. They coincide only in high-index lenses
- C. They coincide only in multifocals
- D. They coincide when no prism is prescribed

14. Which conversion is correct?

- A. 1 inch equals 25.4 mm
- B. 1 inch equals 2.54 mm
- C. 1 inch equals 10 mm
- D. 1 inch equals 12 mm

15. A +2.00 cylinder lies at axis 180. Which statement about its effect is correct?

- A. It exerts full power at axis 180
- B. It exerts zero power at axis 180 and full power at 090
- C. It exerts half power at axis 180
- D. It exerts full power at both 180 and 090

16. Which is the MOST appropriate recommendation for a patient who drives often and complains of glare off wet roads?

- A. A solid gradient tint only

- B. A photochromic lens only
- C. A clear lens with no treatment
- D. A polarized lens

17. Which statement about index of refraction is correct?

- A. A higher index yields a thinner lens for a given power
- B. A higher index yields a thicker lens for a given power
- C. Index has no effect on thickness
- D. Index determines only the lens color

18. Which of the following is NOT measured by a lensmeter?

- A. Sphere power
- B. Cylinder and axis
- C. Prism
- D. The frame's temple length

19. A patient reads 10 mm below the OCs with vertical powers OD +4.00 and OS +1.00, both base down. Which is correct?

- A. The imbalance is 5.0Δ, the sum of the two
- B. The imbalance is 4.0Δ, the larger value alone
- C. The imbalance is 3.0Δ, the difference
- D. There is no imbalance because both are base down

19 — note: (single item above)

20. Which statement about a minus lens is correct?

- A. It is thickest at the optical center
- B. It magnifies the wearer's eyes
- C. It is uniform in thickness
- D. It is thickest at the edges and minifies the eyes

21. A patient sensitive to color fringing asks which material reduces it. The MOST appropriate answer is a material with:

- A. The lowest possible Abbe value
- B. A higher Abbe value
- C. The highest possible index
- D. The greatest surface reflection

22. Which is the correct spherical equivalent of $-3.00 -2.00 \times 180$?

- A. -4.00 D
- B. -5.00 D
- C. -3.00 D
- D. -2.00 D

23. Which is NOT a typical property of polycarbonate?

- A. High impact resistance
- B. Light weight
- C. Inherent UV blocking
- D. The highest Abbe value among common materials

24. A high-plus aphakic-style wearer's eyes appear enlarged. Which statement explains this correctly?

- A. Minus lenses magnify the image
- B. The Abbe value is too high
- C. The base curve is too flat
- D. Plus lenses magnify the image

25. Which of the following is the LEAST appropriate use of a high-index lens?

- A. A strong minus Rx in a small rimless frame
- B. A patient prioritizing cosmetic thinness
- C. A low-power Rx where thinness offers little benefit
- D. A strong plus Rx wanting reduced center thickness

26. Which structure provides the greatest share of the eye's refracting power?

- A. The cornea
- B. The crystalline lens
- C. The vitreous humor
- D. The sclera

27. Which statement about rods and cones is correct?

- A. Cones handle dim-light peripheral vision
- B. Cones provide color and detail in bright light
- C. Rods provide sharp color vision
- D. Rods produce the aqueous humor

28. A patient with painless, gradual peripheral vision loss and optic nerve damage most likely has which condition?

- A. Glaucoma
- B. Cataract
- C. Macular degeneration
- D. Amblyopia

29. Which statement correctly distinguishes a phoria from a tropia?

- A. A phoria is a constant manifest turn
- B. A tropia is controlled by fusion
- C. A phoria is latent and controlled by fusion
- D. They are identical conditions

30. Which is NOT a refractive error?

- A. Myopia
- B. Hyperopia
- C. Glaucoma
- D. Astigmatism

31. Presbyopia differs from hyperopia in that presbyopia specifically involves:

- A. An eye too short for its power at distance
- B. The age-related loss of accommodation
- C. An unequal corneal curvature
- D. A misalignment of the two eyes

32. Which statement about macular degeneration is correct?

- A. It causes peripheral field loss first
- B. It causes central field loss
- C. It is caused by elevated eye pressure
- D. It is fully correctable with lenses

33. Which systemic condition is most associated with fluctuating refractive error?

- A. Thyroid disease
- B. Rheumatoid arthritis
- C. Diabetes
- D. Hypertension only

34. Which is NOT true of accommodation?

- A. It is performed by the ciliary muscle
- B. It allows focusing on near objects
- C. It declines with age, producing presbyopia
- D. It is controlled by the extraocular muscles

35. Which term means a difference in retinal image size between the two eyes?

- A. Anisometropia
- B. Antimetropia
- C. Emmetropia
- D. Aniseikonia

36. Which statement about exophthalmos is correct?

- A. It is a clouding of the lens
- B. It is a forward protrusion associated with thyroid disease
- C. It is a loss of central vision
- D. It is an elevation of intraocular pressure

37. Which is the MOST appropriate description of convergence?

- A. The outward rotation of the eyes for distance
- B. The involuntary oscillation of the eyes
- C. The inward rotation of the eyes for near
- D. The clouding of the crystalline lens

38. Which is NOT correctly paired with the part of vision it serves?

- A. Cones — color and detail
- B. Rods — sharp daylight color vision
- C. Macula — central vision
- D. Rods — peripheral and dim-light vision

39. A patient needs eyewear for a high-impact racquet sport. Which is the MOST appropriate material?

- A. Polycarbonate
- B. Crown glass
- C. Ultra-high index
- D. Standard CR-39

40. Which mounting-to-edge-treatment pairing is correct?

- A. Full-rim frame requires a drilled hole
- B. Semi-rimless frame requires a groove
- C. Rimless frame requires a standard bevel
- D. Full-rim frame requires a nylon cord

41. Which is NOT a limitation an optician should communicate about photochromic lenses?

- A. They may darken less behind a windshield
- B. They permanently fix the refractive error
- C. They may react slowly in cold temperatures
- D. They activate mainly in response to UV

42. A patient with a nickel allergy needs a frame. The MOST appropriate choice is:

- A. A nickel-rich alloy
- B. The same alloy with thin plating
- C. An untreated base metal
- D. Titanium or a hypoallergenic material

43. Which statement about a polarized lens is correct?

- A. It darkens automatically in UV
- B. It corrects astigmatism
- C. It eliminates all reflections of any kind
- D. It blocks horizontal reflected glare such as off water

44. Which is the MOST appropriate recommendation for a patient needing the widest sustained near field for drafting?

- A. An executive-style bifocal
- B. A small round-segment bifocal
- C. A progressive in a shallow frame
- D. A pair of OTC readers

45. Which is NOT true of OTC reading glasses?

- A. They have the same power in both lenses
- B. They have a fixed optical-center spacing
- C. They suit simple presbyopic near use
- D. They reliably correct astigmatism

46. Which lens enhancement most directly reduces reflections and increases light to the eye?

- A. An anti-reflective coating
- B. A solid tint
- C. Edge polishing
- D. A scratch coat alone

47. A rimless drill-mount frame is best fitted with which material?

- A. Crown glass
- B. Standard CR-39
- C. Polycarbonate or Trivex
- D. Untempered glass

48. Which statement about a dark sunglass lens lacking UV protection is correct?

- A. It reflects all light away from the eye
- B. It permanently corrects the Rx
- C. It increases the eye's impact resistance
- D. It can be harmful by dilating the pupil while admitting UV

49. Which is the MOST appropriate description of a low vision aid's mechanism?

- A. Magnification and contrast enhancement
- B. Surgical retinal repair
- C. Reversal of the underlying disease
- D. Restoration of normal 20/20 acuity

50. Which is NOT a typical low vision aid?

- A. A handheld magnifier
- B. A high-add reading lens
- C. An electronic video magnifier
- D. A standard distance-only single vision lens

51. Which describes a gradient tint correctly?

- A. It is uniform in density throughout
- B. It is darker at the top and lighter at the bottom
- C. It changes color in sunlight
- D. It blocks only horizontal glare

52. A trifocal differs from a bifocal by adding a zone for:

- A. The smallest near print
- B. Distant road signs
- C. Peripheral motion only
- D. Intermediate distances such as a monitor

53. Which patient is the MOST appropriate candidate for a hypoallergenic titanium frame?

- A. A patient wanting the heaviest possible frame
- B. A patient with a documented nickel allergy
- C. A patient seeking the cheapest option only
- D. A patient requesting a disposable frame

54. Which is the MOST appropriate recommendation for a patient whose eyes look magnified through a strong plus Rx?

- A. An aspheric lens design
- B. A steeper base curve
- C. A larger lens blank
- D. A thicker lens center

55. Which mounting requires a groove cut in the lens edge?

- A. A full-rim frame
- B. A rimless drill-mount frame
- C. A semi-rimless nylon-cord frame
- D. A frameless press-fit mount

56. Which is NOT true of the executive bifocal?

- A. Its near segment spans the full lens width
- B. It changes power continuously with no line
- C. It provides a wide near field
- D. It tends to be heavier than smaller segments

57. Which is the MOST appropriate frame for a patient needing maximum after-dispensing bridge adjustability?

- A. A fixed saddle-bridge plastic frame
- B. A one-piece molded plastic frame
- C. A metal frame with adjustable nose pads
- D. A fixed keyhole-bridge plastic frame

58. Which statement about high-index lenses is correct?

- A. They have higher Abbe values than CR-39
- B. They reflect less light than standard plastic
- C. They are thinner but reflect more light
- D. They eliminate the need for any coating

59. Which is the MOST appropriate lens recommendation for full-time monitor and desk work?

- A. An occupational/computer lens
- B. A distance-only single vision lens
- C. A polarized driving lens
- D. A plano mirror-coated lens

60. Which is NOT a reason to recommend an anti-reflective coating?

- A. To reduce glare while night driving
- B. To recover light transmission on high-index lenses
- C. To make the lens scratch-proof
- D. To reduce surface reflections for cosmetics

61. A photochromic lens may underperform in which situation?

- A. Standing in direct sun
- B. Walking outdoors on a clear day
- C. Being at high altitude
- D. Driving behind a windshield

62. A lensmeter (focimeter) primarily measures:

- A. The back vertex power of a lens
- B. The lens surface curvature
- C. The patient's pupillary distance
- D. The vertex distance to the cornea

63. Which instrument measures a lens's surface curvature in diopters?

- A. The distometer
- B. The pupillometer
- C. The lens clock
- D. The circumference gauge

64. Which is NOT true of a lens clock?

- A. It measures surface curvature in diopters
- B. It is the primary tool for checking base curve
- C. It reads one surface at a time
- D. It measures the total back vertex power of the lens

65. Which instrument measures the gap between the back of the lens and the cornea?

- A. The lens clock
- B. The pupillometer
- C. The distometer
- D. The circumference gauge

66. When verifying a finished lens, the back surface faces the lensmeter stop because the standard is:

- A. Front vertex power
- B. Back vertex power
- C. Surface curvature power
- D. Equivalent air power

67. Which statement about prism on a lensmeter is correct?

- A. It blurs the target beyond focusing
- B. It stops the axis wheel from turning
- C. It changes the eyepiece magnification
- D. It displaces the target from the reticle center

68. Which is the MOST accurate statement about a lens clock used on a high-index lens?

- A. It cannot measure curvature at all
- B. It measures curvature faithfully but gives an inexact power value
- C. Its calibration permanently changes
- D. It reads a pupillary distance value

69. How is the add power of a multifocal verified on a lensmeter?

- A. By reading only the near zone
- B. By reading only the distance zone
- C. By multiplying the two readings
- D. By subtracting the distance reading from the near reading

70. Which is NOT typically captured by a digital measurement system?

- A. Pupillary distance
- B. Pantoscopic tilt
- C. Vertex distance
- D. The lens material's Abbe value

71. A centered lensmeter target with no displacement indicates reading through the:

- A. Optical center
- B. Thickest edge
- C. Segment line
- D. Bevel apex

72. Which instrument measures the patient's pupillary distance using the corneal light reflex?

- A. The lens clock
- B. The distometer
- C. The corneal reflex pupillometer
- D. The circumference gauge

73. Calipers are most appropriately used to measure:

- A. The patient's pupillary distance
- B. The back vertex power
- C. Lens thickness and small linear dimensions
- D. The UV transmission percentage

74. Which is NOT a correct instrument-to-measurement pairing?

- A. Lensmeter — back vertex power
- B. Lens clock — surface curvature
- C. Distometer — vertex distance
- D. Pupillometer — lens base curve

75. An automatic lensmeter differs from a manual one in that it:

- A. Measures only front vertex power
- B. Displays the readings electronically
- C. Cannot read cylinder or axis
- D. Requires no lens inserted

76. Plastic (zyl) frames must be prepared for bending by:

- A. Warming them with a frame heater
- B. Cooling them in cold water
- C. Freezing them overnight
- D. Bending them while fully cold

77. Which is the MOST appropriate tool for angling a frame's nose pads?

- A. Cutting pliers
- B. Pad-adjusting pliers
- C. Round-nose pliers
- D. A lens clock

78. Metal frames, unlike plastic frames, are generally adjusted:

- A. Only when frozen
- B. After warming with a heater
- C. Only after solvent soaking
- D. Cold at room temperature

79. Padded nylon-jaw pliers are used during adjustment to:

- A. Apply greater bending force
- B. Protect the frame finish from marring
- C. Heat the frame faster
- D. Measure the frame dimensions

80. A circumference (lens) gauge measures a lens's:

- A. Back vertex power
- B. Surface curvature
- C. Size or perimeter
- D. Center thickness

81. Which is NOT a function of the lensmeter?

- A. Reading sphere and cylinder power
- B. Reading the cylinder axis
- C. Measuring prism
- D. Measuring the frame temple length

82. A monocular PD is preferred over a binocular PD chiefly for patients with:

- A. A very low prescription
- B. A metal-frame preference
- C. Facial asymmetry
- D. No prior eyewear

83. A millimeter ruler is most appropriately used to measure:

- A. The patient's pupillary distance
- B. The total lens power
- C. The lens surface curvature
- D. The material's dispersion

84. Round-nose pliers are most appropriately used to:

- A. Cut the nylon retaining cord
- B. Form curves and bends in metal components
- C. Read the lens base curve
- D. Measure the segment height

85. Which is the MOST appropriate first step in troubleshooting a complaint about new eyewear?

- A. Verify the lenses against the prescription
- B. Immediately remake the lenses
- C. Blame the prescriber's Rx
- D. Replace the frame with a new style

86. Which is NOT part of the fitting triangle's support?

- A. The nose
- B. The right ear
- C. The chin
- D. The left ear

87. Pantoscopic tilt is the angle at which:

- A. The lower edge of the lens sits closer to the face
- B. The frame curves horizontally around the face
- C. The temples bend behind the ears
- D. The lens rotates about its center

88. As pantoscopic tilt increases, the optical center should generally be:

- A. Raised toward the top
- B. Lowered relative to the pupil
- C. Moved temporally
- D. Left unchanged

89. For most flat-top bifocal fits, the segment top is set at the:

- A. Center of the pupil
- B. Upper frame edge
- C. Eyebrow line
- D. Lower eyelid margin

90. A progressive lens's fitting cross is aligned with the:

- A. Center of the pupil in primary gaze
- B. Lower eyelid margin
- C. Top frame edge
- D. Temporal canthus

91. Which is the MOST appropriate first check when a patient reports headaches in new glasses whose power verifies correct?

- A. The PD and optical-center placement
- B. The lens tint density
- C. The coating brand
- D. The frame color

92. A patient reports the floor "swims" in new glasses with verified-correct power. The MOST likely cause is a change in the:

- A. Lens tint density
- B. Base curve from the previous pair
- C. Frame temple length
- D. Anti-reflective coating type

93. Which is NOT an appropriate response to a patient's frame sliding down the nose?

- A. Check the bridge or nose-pad fit
- B. Conclude the prescription is wrong and remake the lenses
- C. Adjust the temples
- D. Examine the fitting triangle's support

94. A first-time progressive wearer's mild initial peripheral blur is best understood as:

- A. Expected adaptation to the design
- B. A definite power error
- C. A coating defect
- D. A frame-material error

95. A lifestyle assessment guides product choice mainly because:

- A. Working distances and tasks drive selection
- B. Only frame color depends on it
- C. The Rx alone dictates everything
- D. Activities have no bearing on lenses

96. Which is the MOST likely cause of double vision in glasses whose power verifies correct?

- A. A defective scratch coat
- B. An incorrect tint density
- C. A centration error inducing prism
- D. An expired frame warranty

97. A patient with good distance and near vision but blurry arm's-length vision needs:

- A. A darker near tint
- B. An intermediate zone (trifocal or progressive)
- C. A stronger distance lens
- D. A larger frame only

98. Which is the MOST appropriate step for a patient moving to a high-wrap frame with a strong Rx?

- A. Optically compensate the lenses for the wrap
- B. Make the lenses thicker only
- C. Leave the lenses uncoated
- D. Cut the lenses to the smallest blank

99. Which is NOT a recommended way to reduce edge thickness for a strong minus Rx?

- A. Choose a high-index material
- B. Choose a smaller, well-centered frame
- C. Choose the largest fashionable frame
- D. Center the optics accurately

100. Vertex distance most affects effective power when the prescription is:

- A. Below 1.00 D
- B. High (around 4.00 D or more)
- C. Plano in both meridians
- D. Purely low-power cylindrical

101. Which patient measurement determines optical-center placement?

- A. The pupillary distance
- B. The vertex distance
- C. The temple length
- D. The base curve

102. Which is NOT a likely cause when a patient's bifocal segment intrudes on distance vision?

- A. The segment was set too high
- B. The segment top is above the lower lid
- C. The seg height was misjudged in fitting
- D. The lens index is too high

103. A patient's frame sits too far from the eyes on a high-plus Rx, increasing vertex distance. The lens delivers:

- A. Exactly the prescribed power
- B. More minus than prescribed
- C. No change, since vertex never matters
- D. Less effective plus power than intended

104. The fundamental purpose of correct centration is to:

- A. Increase scratch resistance
- B. Place the OC before the pupil and avoid induced prism
- C. Darken the lens automatically
- D. Raise the Abbe value

105. A patient with high anisometropia and reading-level vertical imbalance is commonly helped by a:

- A. Larger frame eye size
- B. Heavier anti-reflective coating
- C. Steeper base curve on both lenses
- D. Slab-off applied to one lens

106. Which is NOT a position-of-wear factor affecting the optics a patient receives?

- A. Pantoscopic tilt
- B. The lens material's Abbe value
- C. Face-form (wrap) angle
- D. Vertex distance

107. A patient needs a frame deep enough for a progressive's three zones. The optician ensures adequate:

- A. Temple length
- B. Vertical (B) measurement depth
- C. Bridge width only
- D. Effective-diameter reduction

108. Anisometropia produces vertical imbalance specifically when:

- A. Looking straight ahead through the OCs
- B. Both eyes are closed
- C. The eyes gaze below the OCs to read
- D. The frame is perfectly level

109. Which is the MOST appropriate explanation for measuring monocular PDs?

- A. They improve accuracy for an asymmetric face
- B. They are faster and need no instrument
- C. They measure vertex distance simultaneously
- D. They eliminate the need for a pupillometer

110. A patient does extensive night driving. Which recommendation most directly improves night clarity and reduces glare?

- A. A dark solid tint for all conditions
- B. A heavily mirrored lens
- C. An anti-reflective coating
- D. A small frame eye size

111. Which is NOT true regarding ANSI Z80 tolerances?

- A. A lens is acceptable when within tolerance for each parameter
- B. A lens must match every prescribed number exactly
- C. Axis tolerance tightens as cylinder power increases
- D. Sphere, cylinder, axis, add, and prism each have tolerances

112. Which federal agency requires that dress eyeglass lenses be impact resistant?

- A. FDA
- B. OSHA
- C. EPA
- D. HIPAA

113. ANSI Z87 governs which category of eyewear?

- A. Dress prescription lenses
- B. Contact lens solutions
- C. Occupational safety eyewear
- D. Patient privacy records

114. Which is NOT protected health information under HIPAA?

- A. A patient's prescription
- B. The frame manufacturer's public catalog
- C. A patient's identifying details
- D. A patient's stored exam records

115. A patient requests eyewear for arc welding using ordinary dress lenses. The MOST appropriate action is to:

- A. Warn that the eyewear is not occupationally rated
- B. Dispense them silently
- C. Add a darker fashion tint instead
- D. Substitute OTC readers

116. Which agency most directly governs the disposal of chemical waste from an optical lab?

- A. HIPAA
- B. EPA
- C. The FDA drop-ball rule
- D. ANSI Z80

117. Which is NOT a function of the duty to warn?

- A. Informing patients that dress eyewear is not safety-rated
- B. Confirming UV protection is a separate property
- C. Guaranteeing the lens has the highest Abbe value
- D. Advising on a product's proper use and limitations

118. ASTM standards, distinct from ANSI Z87, most directly govern:

- A. Dress prescription lens tolerances
- B. Sports and recreational protective eyewear
- C. Patient privacy records
- D. Environmental waste disposal

119. A patient is generally entitled to which of the following regarding their own eyewear prescription?

- A. A copy of their own prescription
- B. No access to their own records
- C. Only a verbal summary
- D. Access only through a third party

120. Which is the MOST appropriate action when a third party requests a patient's full record?

- A. Release it whenever convenient for staff
- B. Post it publicly for access
- C. Release it without any restriction
- D. Release it only as permitted by HIPAA or with patient consent

121. Which is NOT a correct statement about UV protection and tint?

- A. UV protection is a separate property to confirm
- B. A dark tint without UV can be worse than no sunglasses
- C. UV blocking should be verified independently
- D. A dark tint always guarantees UV protection

122. The ANSI Z80 series specifically sets standards for:

- A. Workplace bloodborne pathogen handling
- B. Patient health-record privacy
- C. Ophthalmic product tolerances
- D. Environmental waste disposal

123. Which correctly distinguishes the FDA's role from OSHA's in eyewear?

- A. The FDA governs only employee workplace safety
- B. OSHA sets the dress-lens drop-ball requirement
- C. Both regulate only patient privacy
- D. The FDA sets the dress-lens impact rule; OSHA governs workplace safety

124. Which is the MOST appropriate action when a patient requests dress glasses for racquetball?

- A. Dispense them for the sport without comment
- B. Add a darker tint to make them sport-rated
- C. Substitute OTC readers for the activity
- D. Recommend ASTM-rated sports eyewear and warn of the limitation

125. Which statement about EMR systems and HIPAA is correct?

- A. EMR systems are exempt from privacy rules
- B. EMR systems govern lens impact testing
- C. EMR systems must comply with HIPAA privacy and security rules
- D. HIPAA applies only to paper records

Answer Key & Full Explanations

1. A — The lens material's Abbe value. A written Rx specifies sphere, cylinder, axis, add, and prism — but not the Abbe value, which is a material property chosen during dispensing. Abbe value is therefore the exception among prescription components.
2. C — Assume an axis of 180 and proceed to order. Assuming an axis and proceeding is the least appropriate action, because a cylinder requires its true axis and guessing risks an incorrect lens. The correct response is to recognize the incompleteness and verify with the prescriber.
3. C — The 180 meridian carries -4.00 D and the 090 carries -6.00 D. The axis is 180, so the cylinder has zero power there (only the -4.00 sphere), while the full cylinder acts 90° away: $-4.00 + (-2.00) = -6.00$ D in the 090 meridian. This is the two-meridian behavior of a spherocylindrical lens.
4. B — Changing the sphere by exactly half the axis value. Transposition combines the sphere with the cylinder, reverses the cylinder sign, and rotates the axis 90° — it never involves "half the axis value." That fabricated step is the invalid one.
5. B — A high-index material in a smaller, well-centered frame. The thinnest result for a strong minus Rx combines a high-index material with a smaller, well-centered frame to limit edge thickness. Low-index materials and oversized frames work against thinness.

6. D — The center thickness. A minus lens is thin at the center, and its center thickness does not increase with stronger power; edge thickness, induced prism, and minification all do. Center thickness is the exception.

7. C — It is 3.0Δ base down for a plus lens viewed below center. Convert 10 mm to 1.0 cm: $\Delta = 1.0 \times 3.00 = 3.0\Delta$; a plus lens has its base toward the optical center, so viewing below center gives base down. Both magnitude and base direction must be correct.

8. A — Polycarbonate. Polycarbonate is the most appropriate material for a child's everyday eyewear because of its impact resistance, light weight, and inherent UV blocking. Glass and brittle materials are inappropriate for children.

9. C — A higher Abbe value indicates less chromatic aberration. A high Abbe value means low dispersion and therefore less chromatic aberration. Abbe value runs inversely to index and is unrelated to scratch resistance.

10. D — The frame PD is 70 mm and 3 mm of inward decentration per lens is needed. Frame PD = $52 + 18 = 70$ mm; total decentration = $70 - 64 = 6$ mm; per lens = 3 mm inward. The centers move nasally because the PD is narrower than the frame PD.

11. A — Photosynthesis. Refraction, reflection, and dispersion are light behaviors relevant to lenses; photosynthesis is a biological process and has no role in ophthalmic optics. It is the clear exception.

12. A — The patient is myopic, about -2.00 D. A far point at 0.5 m with clear near vision indicates myopia, and the power is the reciprocal of the far point: $1 \div 0.5 = 2.00$, so -2.00 D. This is the defining presentation of nearsightedness.

13. D — They coincide when no prism is prescribed. The optical center and major reference point coincide only when no prism is prescribed; prescribed prism separates them. This distinction is fundamental to centration.

14. A — 1 inch equals 25.4 mm. The standard inch-to-millimeter conversion is 25.4 mm. From it any inch-based dispensary measurement can be derived.

15. B — It exerts zero power at axis 180 and full power at 090. The cylinder axis marks the meridian of zero cylinder power, so a cylinder at axis 180 has no power there and full power 90° away at 090. Cylinder effect grows from 0% at the axis to 100% at 90°.

16. D — A polarized lens. Polarized lenses block horizontally oriented reflected glare, such as that off a wet road, more effectively than a tint or photochromic alone. This makes them the most appropriate choice for driving glare.

17. A — A higher index yields a thinner lens for a given power. A higher index bends light more strongly, so less thickness is needed for the same power. This is the cosmetic advantage of high-index materials.

18. D — The frame's temple length. A lensmeter measures sphere, cylinder, axis, add, and prism — but not the frame temple length, a frame dimension. This makes temple length the exception.

19. C — The imbalance is 3.0Δ, the difference. Apply Prentice's rule at 1.0 cm: OD = 1.0 × 4.00 = 4.0Δ and OS = 1.0 × 1.00 = 1.0Δ, both base down; subtract: 4.0 – 1.0 = 3.0Δ. The imbalance is the difference between the two eyes' induced prism.

20. D — It is thickest at the edges and minifies the eyes. A minus lens is thin at the center, thickest at the edges, and minifies the wearer's eyes. This is the opposite of a plus lens's profile and effect.

21. B — A higher Abbe value. A patient sensitive to color fringing is best served by a higher-Abbe material, which produces less chromatic aberration. The trade-off is a thicker lens for the same power.

22. A — -4.00 D. Spherical equivalent equals sphere plus half the cylinder: $-3.00 + (\frac{1}{2} \times -2.00) = -3.00 + (-1.00) = -4.00$ D. Carrying the cylinder's sign through is essential.

23. D — The highest Abbe value among common materials. Polycarbonate has a relatively low Abbe value (~30), so this is NOT one of its properties; it is impact resistant, lightweight, and UV-blocking. The low Abbe value is the trade-off for its safety advantages.

24. D — Plus lenses magnify the image. A plus lens magnifies, making a high-plus wearer's eyes appear enlarged. Aspheric designs and reduced vertex distance help minimize this.

25. C — A low-power Rx where thinness offers little benefit. High-index material is least appropriate for a low-power Rx, where the thinness benefit is minimal and the Abbe/reflection trade-offs are not worth the cost. Strong prescriptions are where high index pays off.

26. A — The cornea. The cornea provides the greatest share of the eye's refracting power (about two-thirds), more than the crystalline lens. Its clarity and curvature are critical to vision.

27. B — Cones provide color and detail in bright light. Cones, concentrated at the macula, provide color and fine detail in bright (photopic) light. Rods, by contrast, handle dim-light and peripheral vision without color.

28. A — Glaucoma. Painless, gradual peripheral vision loss with optic nerve damage is characteristic of glaucoma. Its symptom-free progression is why IOP screening matters.

29. C — A phoria is latent and controlled by fusion. A phoria is a latent misalignment held in check by the brain's fusion, while a tropia is a constant, manifest turn. This latent-versus-manifest distinction is the key difference.

30. C — Glaucoma. Myopia, hyperopia, and astigmatism are refractive errors; glaucoma is an optic-nerve disease, not a refractive error. It is therefore the exception.

31. B — The age-related loss of accommodation. Presbyopia is specifically the age-related stiffening of the crystalline lens that impairs near focus, corrected with a plus add. Hyperopia, by contrast, is a distance refractive error.

32. B — It causes central field loss. Macular degeneration damages the central retina, causing central vision loss while peripheral vision is preserved. This is the mirror image of glaucoma's peripheral loss.

33. C — Diabetes. Diabetes is most associated with fluctuating refractive error from blood-sugar changes, as well as diabetic retinopathy. Recognizing this pattern is a reason to encourage medical follow-up.

34. D — It is controlled by the extraocular muscles. Accommodation is controlled by the ciliary muscle, not the extraocular muscles, so this statement is the false one. The extraocular muscles move the globe, not the lens.

35. D — Aniseikonia. Aniseikonia is a difference in the size of the two eyes' retinal images, which interferes with fusion. It can result from anisometropia but is a distinct concept.

36. B — It is a forward protrusion associated with thyroid disease. Exophthalmos is a forward protrusion of the eyes most associated with thyroid disease. It can affect frame fit and lid closure.

37. C — The inward rotation of the eyes for near. Convergence is the inward rotation of the eyes to maintain single vision on a near target. Divergence is the opposite movement toward distance.

38. B — Rods — sharp daylight color vision. Rods do NOT provide sharp daylight color vision; they handle dim-light and peripheral vision without color. This is the incorrect pairing.

39. A — Polycarbonate. A high-impact racquet sport demands impact-resistant polycarbonate for safety. Thinness, clarity, and economy are secondary.

40. B — Semi-rimless frame requires a groove. A semi-rimless nylon-cord mounting requires a groove; full-rim uses a bevel and rimless uses drilled holes. This is the correct mounting-to-edge pairing.

41. B — They permanently fix the refractive error. Photochromic lenses do NOT fix the refractive error, so this is not a real limitation — it is a false statement. The genuine limitations are reduced darkening behind a windshield, slow cold-weather reaction, and UV-dependent activation.

42. D — Titanium or a hypoallergenic material. A nickel-allergic patient should be fitted with a hypoallergenic material such as titanium. Nickel-containing alloys, even plated, risk provoking the reaction.

43. D — It blocks horizontal reflected glare such as off water. A polarized lens blocks horizontally oriented reflected glare, such as that off water. It does not darken in UV, correct astigmatism, or eliminate all reflections.
44. A — An executive-style bifocal. The executive bifocal's full-width near segment gives the widest sustained near field for drafting work. Round segments and shallow progressives offer narrower zones.
45. D — They reliably correct astigmatism. OTC readers do NOT reliably correct astigmatism; they carry equal sphere power in both lenses with a fixed OC spacing. This makes the astigmatism claim the false statement.
46. A — An anti-reflective coating. An anti-reflective coating reduces surface reflections and increases light transmission to the eye. Its benefit is greatest on high-index lenses.
47. C — Polycarbonate or Trivex. Rimless drill-mount lenses are stressed at the holes, so impact-resistant polycarbonate or Trivex prevents cracking. Glass and brittle materials are inappropriate.
48. D — It can be harmful by dilating the pupil while admitting UV. A dark non-UV lens dilates the pupil due to reduced brightness while letting UV reach the eye, which can be worse than no sunglasses. This is why UV protection must be confirmed separately.
49. A — Magnification and contrast enhancement. Low vision aids work primarily through magnification and contrast/glare control to maximize remaining vision. They do not restore acuity or reverse disease.
50. D — A standard distance-only single vision lens. A standard distance single vision lens is NOT a low vision aid; magnifiers, high-add readers, and video magnifiers are. It is therefore the exception.
51. B — It is darker at the top and lighter at the bottom. A gradient tint transitions from darker at the top to lighter at the bottom, unlike a uniform solid tint. This distinguishes it from a solid tint.
52. D — Intermediate distances such as a monitor. The trifocal's middle zone serves arm's-length intermediate distances between distance and near. This is the gap a standard bifocal does not address.

53. B — A patient with a documented nickel allergy. A nickel-allergic patient is the most appropriate candidate for hypoallergenic titanium, which avoids the reaction. The other patients have no allergy-related need for it.

54. A — An aspheric lens design. An aspheric lens is flatter and reduces magnification, making a high-plus wearer's eyes appear less enlarged. Steeper curves, larger blanks, and thicker centers worsen the effect.

55. C — A semi-rimless nylon-cord frame. A semi-rimless nylon-cord mounting requires a groove cut in the lens edge to seat the cord. Full-rim uses a bevel and rimless uses drilled holes.

56. B — It changes power continuously with no line. The executive bifocal has a visible full-width segment line, so "changes power continuously with no line" is false — that describes a progressive. The other statements correctly describe the executive bifocal.

57. C — A metal frame with adjustable nose pads. Metal frames with adjustable nose pads allow the bridge fit to be fine-tuned after dispensing. Plastic frames have a largely fixed bridge.

58. C — They are thinner but reflect more light. High-index lenses are thinner for a given power but reflect more light at their surfaces, which is why AR coatings benefit them. They also have lower, not higher, Abbe values than CR-39.

59. A — An occupational/computer lens. Full-time monitor and desk work is best served by an occupational/computer lens optimized for intermediate and near distances. A distance design would underperform.

60. C — To make the lens scratch-proof. AR coating reduces reflections and glare but does NOT make a lens scratch-proof — that is a scratch coating's role, and even then no lens is fully scratch-proof. This is the false reason.

61. D — Driving behind a windshield. Most photochromics activate via UV, which a windshield largely blocks, so they darken less while driving. This is a key limitation to disclose.

62. A — The back vertex power of a lens. The lensmeter measures back vertex power — sphere, cylinder, axis, add, and prism — and locates the optical center. It is the central instrument for verifying finished lenses.

63. C — The lens clock. A lens clock measures a lens's surface curvature in diopters and is the primary tool for checking base curve. The other instruments measure vertex distance, PD, or lens size.

64. D — It measures the total back vertex power of the lens. A lens clock measures surface curvature one surface at a time, not total back vertex power — that is the lensmeter's job. This makes the back-vertex claim the false statement.

65. C — The distometer. The distometer measures the gap between the back of the lens and the cornea (vertex distance). This is used for vertex compensation in higher-powered prescriptions.

66. B — Back vertex power. Spectacle power is specified as back vertex power, so the lens is placed back-surface against the lensmeter stop. Reversing it introduces error in higher powers.

67. D — It displaces the target from the reticle center. Prism is indicated when the lensmeter target is displaced from the reticle center, with the amount and direction giving its magnitude and base. A centered target indicates the optical center.

68. B — It measures curvature faithfully but gives an inexact power value. A lens clock is calibrated to one assumed index, so on a high-index lens it measures curvature faithfully but the power reading is not exact. The curvature itself is read accurately.

69. D — By subtracting the distance reading from the near reading. The add power equals the near zone reading minus the distance zone reading, since the add is the additional near plus power. It is obtained by difference, not read directly.

70. D — The lens material's Abbe value. A digital measurement system captures position-of-wear data — PD, pantoscopic tilt, vertex distance, seg height — but not the material's Abbe value, which is a material property. This makes Abbe value the exception.

71. A — Optical center. A centered, undisplaced lensmeter target indicates the instrument is reading through the optical center, where no prism is present. Displacement would indicate prism.

72. C — The corneal reflex pupillometer. A corneal reflex pupillometer measures PD using the corneal light reflex for accuracy. PD determines optical-center placement.

73. C — Lens thickness and small linear dimensions. Calipers measure lens thickness and small linear dimensions in millimeters. They do not measure power, PD, or UV transmission.

74. D — Pupillometer — lens base curve. A pupillometer measures PD, not lens base curve (that is the lens clock's job), so this pairing is incorrect. The other three pairings are correct.

75. B — Displays the readings electronically. An automatic lensmeter displays its readings electronically once the lens is positioned, reducing operator variability. It measures the same back vertex parameters as a manual instrument.

76. A — Warming them with a frame heater. Plastic (zyl) frames must be warmed before bending because cold plastic is brittle and can crack. The warmth lets the frame reshape and hold its new form.

77. B — Pad-adjusting pliers. Pad-adjusting pliers grip and angle the nose-pad arms to position the pads. Matching the plier to its task protects both the frame and the fit.

78. D — Cold at room temperature. Metal frames are generally adjusted cold, unlike plastic frames which must be warmed first. Knowing which to heat is a practical distinction.

79. B — Protect the frame finish from marring. Padded nylon-jaw pliers grip frame parts without scratching the finish. Metal jaws on cosmetic surfaces would mar the frame.

80. C — Size or perimeter. A circumference (lens) gauge measures a lens's size or perimeter, used in edging and sizing. It does not measure power, curvature, or thickness.

81. D — Measuring the frame temple length. A lensmeter reads sphere, cylinder, axis, add, and prism — but not the frame temple length, a frame dimension. This makes temple length the exception.

82. C — Facial asymmetry. Monocular PDs measure each eye separately from the bridge center, improving accuracy when the face is asymmetric. This ensures each optical center aligns with its own pupil.

83. A — The patient's pupillary distance. A millimeter ruler measures linear distances such as PD and seg height. It cannot measure power, curvature, or dispersion.

84. B — Form curves and bends in metal components. Round-nose pliers are used to form curves and bends in metal frame parts. Each plier shape serves a specific adjustment task.

85. A — Verify the lenses against the prescription. The most appropriate first troubleshooting step is to verify the lenses against the prescription on the lensmeter. Remaking or blaming the Rx before verifying is premature.

86. C — The chin. The fitting triangle's three support points are the nose and the two ears; the chin is not among them. The chin is therefore the exception.

87. A — The lower edge of the lens sits closer to the face. Pantoscopic tilt is the vertical tilt in which the lens's lower edge sits closer to the face than the top. A modest tilt aligns the lens with the downward line of sight.

88. B — Lowered relative to the pupil. As pantoscopic tilt increases, the optical center is lowered (roughly 1 mm per 2° of tilt) to keep the line of sight near the OC. Tilt and OC height are linked.

89. D — Lower eyelid margin. For most flat-top bifocal fits, the segment top is set at the lower eyelid margin so the patient sees over it for distance and into it for near. Setting it too high or low compromises vision.

90. A — Center of the pupil in primary gaze. A progressive lens's fitting cross is aligned with the pupil center in primary gaze so the power zones sit correctly. Fitting it too low places the reading area too far down.

91. A — The PD and optical-center placement. Headaches with correctly verified power suggest a centration error, so the optician checks PD and OC placement, which can induce prism. Centration is verified before blaming the prescription.

92. B — Base curve from the previous pair. A "swim" sensation with correctly verified power often signals a base-curve change from the patient's prior lenses. Matching the previous base curve helps a remake feel familiar.

93. B — Conclude the prescription is wrong and remake the lenses. Concluding the Rx is wrong and remaking the lenses is NOT appropriate for a slipping frame — that is a fit issue addressed by adjusting the bridge and temples. The other actions correctly target the fitting triangle.

94. A — Expected adaptation to the design. Mild initial peripheral blur in a first-time progressive wearer is normal adaptation, not a power error. Recognizing adaptation prevents an unnecessary remake.

95. A — Working distances and tasks drive selection. A lifestyle assessment matters because the patient's daily working distances and tasks, more than the prescription alone, determine the right lens design. The same Rx can call for different products.

96. C — A centration error inducing prism. Double vision in correctly powered glasses most likely reflects a centration error inducing unwanted prism. Coatings, tints, and warranties do not cause diplopia.

97. B — An intermediate zone (trifocal or progressive). Good distance and near but blurry arm's-length vision indicates a missing intermediate zone, supplied by a trifocal or progressive. A tint or stronger distance does not address it.

98. A — Optically compensate the lenses for the wrap. Moving to a high-wrap frame with a strong prescription requires lenses optically compensated for the wrap to avoid peripheral distortion. Thickness changes and blank size do not address the wrap optics.

99. C — Choose the largest fashionable frame. The largest frame is NOT a way to reduce edge thickness — it increases it for a minus Rx. High index, a smaller well-centered frame, and accurate centration all reduce edge thickness.

100. B — High (around 4.00 D or more). Vertex distance meaningfully affects effective power only in higher prescriptions, around 4.00 D and above. Low powers are not meaningfully affected.

101. A — The pupillary distance. PD determines where each lens's optical center must be placed to align with the pupil. Accurate PD prevents unwanted induced prism.

102. D — The lens index is too high. A high lens index does NOT cause a bifocal segment to intrude on distance vision — that results from a seg set too high relative to the lower lid. The index is unrelated to seg-height placement.

103. D — Less effective plus power than intended. Increasing the vertex distance on a high-plus lens reduces its effective power at the eye, so the patient receives less plus than intended. This is why vertex matters in strong plus prescriptions.

104. B — Place the OC before the pupil and avoid induced prism. Correct centration places the optical center in front of the pupil so no unwanted prism is induced in primary gaze. This is the core purpose of accurate centration.

105. D — Slab-off applied to one lens. Significant vertical imbalance from anisometropia is commonly corrected with a slab-off, which adds prism in the reading portion of one lens. This neutralizes the imbalance in down-gaze.

106. B — The lens material's Abbe value. Pantoscopic tilt, wrap, and vertex distance are position-of-wear factors; the Abbe value is a material property, not a position-of-wear factor. This makes Abbe value the exception.

107. B — Vertical (B) measurement depth. A progressive needs adequate vertical (B) depth to fit its distance, intermediate, and near zones. A too-shallow frame cuts off the near area.

108. C — The eyes gaze below the OCs to read. Vertical imbalance arises in down-gaze because the eyes look below the optical centers by different amounts in anisometropia, inducing unequal prism. In primary gaze through the OCs no imbalance occurs.

109. A — They improve accuracy for an asymmetric face. Monocular PDs measure each eye separately, improving accuracy when the face is asymmetric so each OC aligns with its pupil. A single binocular PD can misplace the centers.

110. C — An anti-reflective coating. An anti-reflective coating reduces glare and improves night-driving clarity by cutting surface reflections. A dark or mirrored lens would reduce useful light at night.

111. B — A lens must match every prescribed number exactly. ANSI Z80 requires a lens to be within tolerance for each parameter, NOT to match every number exactly. The exact-match claim is the false statement.

112. A — FDA. The FDA requires that dress eyeglass lenses be impact resistant, regulating eyewear as a medical device. This is distinct from the ANSI Z87 occupational standard.

113. C — Occupational safety eyewear. ANSI Z87 governs occupational and educational safety eyewear, distinct from ANSI Z80 for dress lenses. It imposes stricter impact and protection requirements.

114. B — The frame manufacturer's public catalog. A manufacturer's public catalog is not protected health information; a patient's prescription, identifiers, and exam records are PHI. The catalog is therefore the exception.

115. A — Warn that the eyewear is not occupationally rated. The duty to warn requires telling the patient that ordinary dress lenses are not rated for occupational hazards like arc welding. Dispensing silently would be a safety and liability failure.

116. B — EPA. The EPA most directly governs the safe disposal of chemical waste from an optical lab. HIPAA, the FDA, and ANSI address privacy and products instead.

117. C — Guaranteeing the lens has the highest Abbe value. The duty to warn concerns informing patients of limitations and proper use, not guaranteeing a material property like the highest Abbe value. That guarantee is not a duty-to-warn function.

118. B — Sports and recreational protective eyewear. ASTM standards most directly govern sports and recreational protective eyewear, distinct from ANSI Z87 (occupational) and Z80 (dress). Matching the standard to the use is the testable skill.

119. A — A copy of their own prescription. Patients are generally entitled to a copy of their own prescription. Withholding it or limiting them to a verbal summary is improper.

120. D — Release it only as permitted by HIPAA or with patient consent. A third party's request for a patient's record may be honored only as permitted under HIPAA or with the patient's consent. Arbitrary or public disclosure violates privacy rules.

121. D — A dark tint always guarantees UV protection. The claim that a dark tint always guarantees UV protection is FALSE; UV protection is a separate property that must be confirmed. A dark non-UV lens can be worse than no sunglasses.

122. C — Ophthalmic product tolerances. The ANSI Z80 series sets standards for ophthalmic product tolerances, against which lenses are verified. It does not govern pathogens, privacy, or waste.

123. D — The FDA sets the dress-lens impact rule; OSHA governs workplace safety. The FDA requires dress lenses to be impact resistant, while OSHA governs employee workplace safety — distinct roles. Confusing the two is a common error.

124. D — Recommend ASTM-rated sports eyewear and warn of the limitation. Dress glasses meeting only the FDA impact rule are not sport-rated, so the optician recommends ASTM-rated sports eyewear and warns of the limitation. A tint or readers do not provide protection.

125. C — EMR systems must comply with HIPAA privacy and security rules. Electronic medical record systems holding patient data must comply with HIPAA's privacy and security rules. HIPAA applies to electronic records, not only paper.