



MIXED REVIEW FOR TEKS

Lessons 14.5–14.7

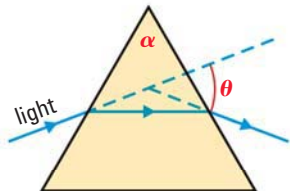
MULTIPLE CHOICE

1. **PHYSICAL SCIENCE** The force F (in pounds) on a person's back when he or she bends over at an angle of θ is given by

$$F = \frac{0.6W \sin(\theta + 90^\circ)}{\sin 12^\circ}$$

where W is the person's weight (in pounds). Which of the following is equivalent to the given formula? **TEKS a.4**

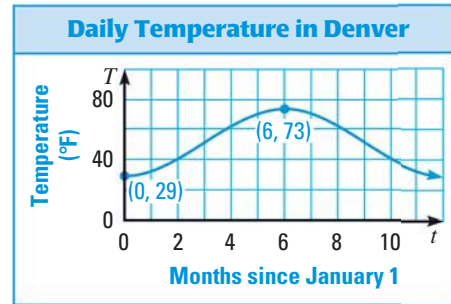
- (A) $24.8W \sin \theta$ (B) $20.6 \cos \theta$
 (C) $2.89 \sin \theta$ (D) $2.89W \cos \theta$
2. **INDEX OF REFRACTION** The index of refraction n of a transparent material is the ratio of the speed of light in a vacuum to the speed of light in the material. Some common materials and their indices are air (1.00), water (1.33), and glass (1.5). Triangular prisms are often used to measure the index of refraction based on the formula shown below. If the given prism is made of glass and $\alpha = 60^\circ$, what is the approximate value of θ ? (*Hint: Write the formula for the index of refraction in terms of $\cot \frac{\theta}{2}$.)* **TEKS a.4**



$$n = \frac{\sin\left(\frac{\theta}{2} + \frac{\alpha}{2}\right)}{\sin \frac{\theta}{2}}$$

- (F) 38.3° (G) 76.5°
 (H) 82.0° (J) 126.7°
3. **EVALUATING EXPRESSIONS** What is the value of $\tan(a + b)$ given that $\sin a = \frac{3}{5}$ with $0 < a < \frac{\pi}{2}$ and $\cos b = \frac{\sqrt{2}}{2}$ with $0 < b < \frac{\pi}{2}$? **TEKS a.3**
- (A) -1 (B) $2\frac{1}{7}$
 (C) 3 (D) 7

4. **AVERAGE TEMPERATURE** The graph below shows the average daily temperature T (in degrees Fahrenheit) in Denver, Colorado. The time t is measured in months, with $t = 0$ representing January 1. Use a trigonometric model to estimate the days of the year when the average daily temperature in Denver, Colorado, is 65°F . **TEKS a.4**

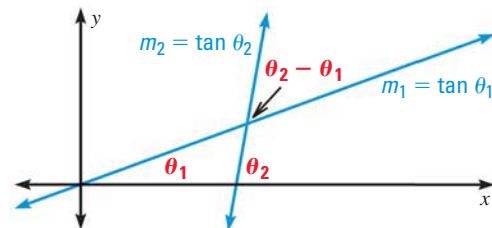


- (F) March 16 and August 15
 (G) March 25 and August 6
 (H) April 10 and July 21
 (J) April 27 and July 3

GRIDDED ANSWER

5. **ANGLE OF INTERSECTION** In the figure shown below, the acute angle of intersection, $\theta_2 - \theta_1$, of two lines with slopes m_1 and m_2 is given by this equation:

$$\tan(\theta_2 - \theta_1) = \frac{m_2 - m_1}{1 + m_1 m_2}$$



Find the acute angle of intersection of the lines $y = \frac{1}{2}x$ and $y = 2x - 4$. Round your answer to the nearest tenth of a degree. **TEKS a.4**