

BECA/Hudson / IB math

pretest

7 Oct 2019

Solutions

1. a) $2.094395...$
 ≈ 2.09

b) 0.8660254
 ≈ 0.866

2. a) $45,610 \approx 45,600$

b) 0.00190

3. $r = \frac{36}{2} = 18$

$$V = \frac{4}{3}\pi (18)^3$$
$$= 24,429.024...$$
$$\approx 24,400 \text{ m}^3$$

4. $V = \frac{1}{3}\pi r^2(24) = 220.5\pi$

$$r^2 = 9.1875 \times 3$$
$$r = \cancel{3.0310887...} \quad 5.25 \text{ cm}$$
$$\approx \cancel{3.03}$$

5. a) 0.8

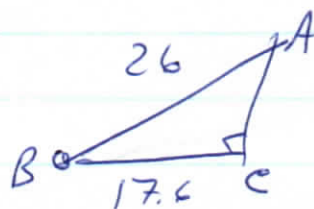
b) $\hat{A} = \sin^{-1} 0.8 = 53.1301...$
 $\approx 53.1^\circ$

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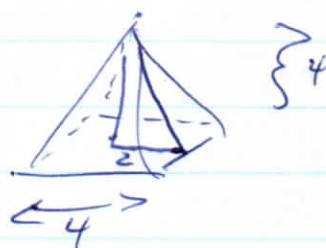
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$$\begin{aligned} 6. \hat{B} &= \cos^{-1}\left(\frac{17.6}{26}\right) \\ &= 47.39633... \\ &\approx 47.4 \end{aligned}$$

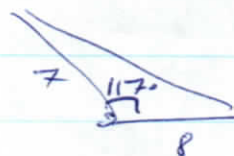
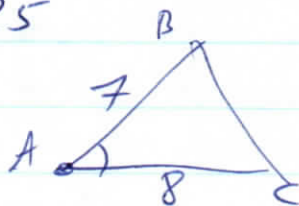


$$\begin{aligned} 7. \quad c^2 &= 2^2 + 4^2 \\ c^2 &= 20 \\ c &= \sqrt{20} \\ &= 2\sqrt{5} \end{aligned}$$



$$8. a) A = \frac{1}{2} \sin A (7)(8) = 25$$

$$\begin{aligned} \sin A &= 0.89285... \\ A &= 63.23449... \\ &\approx 63.2^\circ \end{aligned}$$



$$\begin{aligned} \text{or } A &= 180 - 63.23... \\ &= 116.7655... \\ &\approx 117^\circ \end{aligned}$$

$$\begin{aligned} b) \quad BC^2 &= 7^2 + 8^2 - 2(7)(8)\cos 117^\circ \\ &= \cancel{16} 163.438... \\ BC &= 12.78429... \\ &\approx 12.8 \end{aligned}$$

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$$9. a) \frac{Ac}{\sin 43} = \frac{11}{\sin 50}$$

$$\begin{aligned} Ac &= 11 \frac{\sin 43}{\sin 50} \\ &= 9.793141... \\ &\approx 9.79 \end{aligned}$$

$$b) m\angle C = 87^\circ$$

$$\begin{aligned} A &= \frac{1}{2} (11) (9.7931...) \sin 87^\circ \\ &= 53.7884... \\ &\approx 53.8 \end{aligned}$$

$$10. a) BD^2 = 4.2^2 + 5.1^2 - 2(4.2)(5.1) \cos 78^\circ$$
$$= 34.74306...$$

$$\begin{aligned} BD &= 5.894324... \\ &\approx 5.89 \end{aligned}$$

$$b) \cos B = \frac{8.3^2 - 8^2 - (5.8943...) ^2}{-2(8.8)(5.8943...)}$$

$$\begin{aligned} \hat{A} B \hat{P} &= 0.316544... \\ &= 71.54591... \\ &\approx 71.5^\circ \end{aligned}$$