Trigonometria - Fundamentos de matemática elementar

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Lecture 2x: Exercises (FME 3 - 9th ed.)

2.1

$$sin(B) = \frac{9}{15} \tag{1}$$

$$cos(B) = \frac{12}{15} \tag{2}$$

$$tan(B) = \frac{9}{12} \tag{3}$$

$$cot(B) = \frac{12}{9} \tag{4}$$

$$sin(C) = \frac{12}{15} \tag{5}$$

$$cos(C) = \frac{9}{15} \tag{6}$$

$$tan(C) = \frac{12}{9} \tag{7}$$

$$cot(C) = \frac{9}{12} \tag{8}$$

2.2

$$a^2 = b^2 + c^2 \rightarrow a = \sqrt{4^2 + 2^2} = \sqrt{20} = 2\sqrt{5} \tag{9}$$

$$sin(D) = \frac{4}{2\sqrt{5}} = \frac{2}{\sqrt{5}} = \frac{2\sqrt{5}}{5} \tag{10}$$

$$cos(D) = \frac{2}{2\sqrt{5}} = \frac{\sqrt{5}}{5} \tag{11}$$

$$tan(D) = \frac{4}{2} = 2 \tag{12}$$

$$cot(D) = \frac{2}{4} = \frac{1}{2} \tag{13}$$

$$sin(E) = \frac{2}{2\sqrt{5}} = \frac{\sqrt{5}}{5} \tag{14}$$

$$cos(E) = \frac{4}{2\sqrt{5}} = \frac{2\sqrt{5}}{5} \tag{15}$$

$$tan(E) = \frac{2}{4} = \frac{1}{2} cot(E) = \frac{4}{2} = 2 \tag{16}$$

2.3

$$a^2 = b^2 + c^2 \rightarrow c^2 = a^2 - c^2 \rightarrow c = \sqrt{(2\sqrt{3})^2 - 3^2} = \sqrt{3} \tag{17}$$

$$sin(B) = \frac{3}{2\sqrt{3}} = \frac{\sqrt{3}}{2} \tag{18}$$

$$cos(B) = \frac{\sqrt{3}}{2\sqrt{3}} = \frac{1}{2} \tag{19}$$

$$tan(B) = \frac{3}{\sqrt{3}} = \sqrt{3} \tag{20}$$

$$cot(B) = \frac{\sqrt{3}}{3} \tag{21}$$

$$sin(C) = \frac{\sqrt{3}}{2\sqrt{3}} = \frac{1}{2} \tag{22}$$

$$cos(C) = \frac{3}{2\sqrt{3}} = \frac{\sqrt{3}}{2} \tag{23}$$

$$tan(C) = \frac{\sqrt{3}}{3} \tag{24}$$

$$cot(C) = \sqrt{3} \tag{25}$$

2.4

$$\bar{AB} = \frac{4}{5} \times 50 = 40 \tag{26}$$

$$a^2 = b^2 + c^2 \rightarrow c = \sqrt{50^2 - 40^2} = \sqrt{900} = 30 = \bar{AC} \tag{27}$$

2.5

$$cos(B) = \frac{\bar{AB}}{\bar{BC}} \tag{28}$$

$$\bar{AB} = \frac{2\sqrt{51}}{17} \times 2\sqrt{17} \tag{29}$$

$$= \frac{2\sqrt{17 \times 3}}{17} \times 2\sqrt{17} \tag{30}$$

$$= \frac{2\sqrt{3}}{\sqrt{17}} \times 2\sqrt{17} \tag{31}$$

$$= 4\sqrt{3} \tag{32}$$

$$c^2 = (\bar{AB})^2 - (\bar{BC})^2 \rightarrow c = \sqrt{(2\sqrt{17})^2 - (4\sqrt{3})^2} = 2\sqrt{5} \tag{33}$$

2.6

2.7

$$sin(B) = \frac{3}{5} \tag{34}$$

$$cos(B) \rightarrow cos^2(B) = 1 - sin^2(B) \tag{35}$$

$$cos(B) = \sqrt{1^2 - (\frac{3}{5})^2} \tag{36}$$

$$cos(B) = \sqrt{1 - \frac{9}{25}} \tag{37}$$

$$cos(B) = \sqrt{\frac{16}{25}} \tag{38}$$

$$cos(B) = \frac{4}{5} \tag{39}$$

$$sin(B) = \frac{2}{3} \tag{46}$$

$$cos(B) = \sqrt{1^2 - (\frac{2}{3})^2} \tag{47}$$

$$cos(B) = \sqrt{1 - (\frac{4}{9})} cos(B) = \frac{\sqrt{5}}{3} \tag{48}$$

$$sin(B) = 0,57 \tag{55}$$

$$cos(B) = \sqrt{1^2 - (0,57)^2} \tag{56}$$

$$= \sqrt{0,6751} \tag{57}$$

$$= 0,82 \tag{58}$$

$$sin(B) = 0,95 \tag{63}$$
$$cos(B) = \sqrt{1^2 - (0,95)^2} \tag{64}$$
$$= \sqrt{1 - 0,9} \tag{65}$$
$$= 0,32 \tag{66}$$

2.8