| Student: _____ | **Instructor:** Joe Betters | |
| Date: _____ | **Course:** Pre-Calculus Pre AP (Master Course) | **Assignment:** 8.1 Classwork Day 2 |

1. Use fundamental identities and/or the complementary angle theorem to find the exact value of the given expression. Do not use a calculator.

$$\frac{\sin 51^\circ}{\cos 39^\circ}$$

$\dfrac{\sin 51^\circ}{\cos 39^\circ} =$ _____

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Type an exact answer, using radicals as needed.)

ID: 8.1.21

2. Use fundamental identities and/or the complementary angle theorem to find the exact value of the expression. Do not use a calculator.

$$\tan 76^\circ - \frac{\cos 14^\circ}{\cos 76^\circ}$$

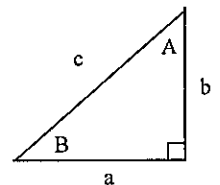$\tan 76^\circ - \dfrac{\cos 14^\circ}{\cos 76^\circ} =$ _____

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression.)

ID: 8.1.25

3.

Use the triangle shown on the right and the given information to solve the triangle.
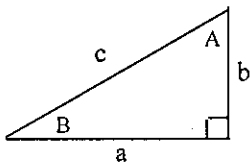
$a = 3$, $A = 35^\circ$; find b, c, and B

b = _____ (Round to two decimal places as needed.)

c = _____ (Round to two decimal places as needed.)

B = _____ ° (Round to one decimal place as needed.)

ID: 8.1.35

4.

Use the right triangle and the given information to solve the triangle.
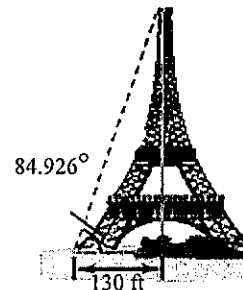
a = 5, c = 8; find b, A, and B

b = _____ (Round to the nearest hundredth as needed.)

A = _____ ° (Round to the nearest tenth as needed.)

B = _____ ° (Round to the nearest tenth as needed.)
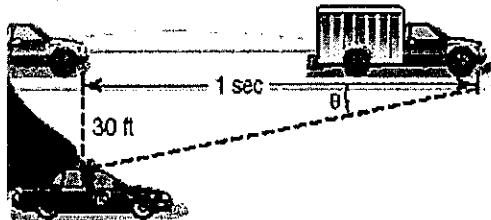
ID: 8.1.41

5. Find the height of the tower using the information given in the illustration.

84.926°

130 ft

The height of the tower is _____ feet.
(Do not round until the final answer. Then round to two decimal places as needed.)

ID: 8.1.51

6.

A state trooper is hidden 30 feet from a highway. One second after a truck passes, the angle θ between the highway and the line of observation from the patrol car to the truck is measured. See the illustration.

(a) If the angle measures $16°$, how fast is the truck traveling? Express the answer in feet per second and in miles per hour.

What is the speed of the truck in feet per second?

_____ feet per second

(Do not round until the final answer. Then round to two decimal places as needed.)

What is the speed of the truck in miles per hour?

_____ miles per hour

(Use the answer from part (a) to find this answer. Round to one decimal place as needed.)

(b) If the angle measures $30°$, how fast is the truck traveling? Express the answer in feet per second and in miles per hour.

What is the speed of the truck in feet per second?

_____ feet per second

(Do not round until the final answer. Then round to two decimal places as needed.)

What is the speed of the truck in miles per hour?

_____ miles per hour.

(Use the answer from part (b) to find this answer. Round to one decimal place as needed.)

(c) If the speed limit is 55 miles per hour and a speeding ticket is issued for speeds of 5 miles per hour or more over the limit, for what angles should the trooper issue a ticket?

The trooper should issue a ticket when the angle is equal to or less than _____ $°$.
(Round to the nearest tenth as needed.)

ID: 8.1.57

7. A blimp, suspended in the air at a height of 400 feet, lies directly over a line from a sports stadium to a planetarium. If the angle of depression from the blimp to the stadium is $39°$ and from the blimp to the planetarium is $25°$, find the distance between the sports stadium and the planetarium.
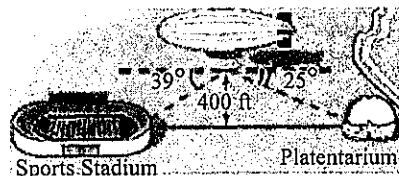
The distance between the sports stadium and the planetarium is _____ feet.
(Round to two decimal places as needed.)

ID: 8.1.69

1. 1

_____

2. 0

_____

3. 4.28

   5.23

   55

_____

4. 6.24

   38.7

   51.3

_____

5. 1464.12

_____

6. 104.62

   71.3

   51.96

   35.4

   18.8

_____

7. 1351.76

_____

8.1 cw day 2

① $\dfrac{\sin 51}{\cos 39} = \dfrac{\cos 39}{\cos 39} = \boxed{1}$

② $\tan 76 - \dfrac{\cos 14}{\cos 76}$

$\dfrac{\sin 76}{\cos 76} - \dfrac{\sin 76}{\cos 76} = \boxed{0}$

③
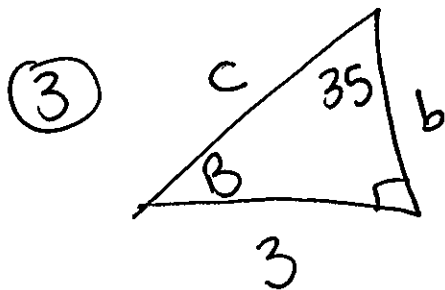
$180 - 90 - 35 = B \quad \boxed{B = 55°}$
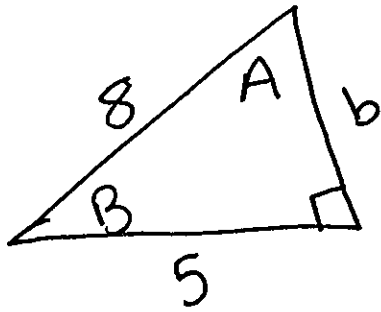
$\dfrac{\sin 35}{3} = \dfrac{\sin 55}{b} \quad \boxed{b = 4.28}$

$\dfrac{\sin 35}{3} = \dfrac{\sin 90}{C} \quad \boxed{C = 5.23}$

④

$$5^2 + b^2 = 8^2 \qquad \boxed{b = 6.24}$$

$$\sin A = \frac{5}{8} \qquad \boxed{A = 38.7°}$$

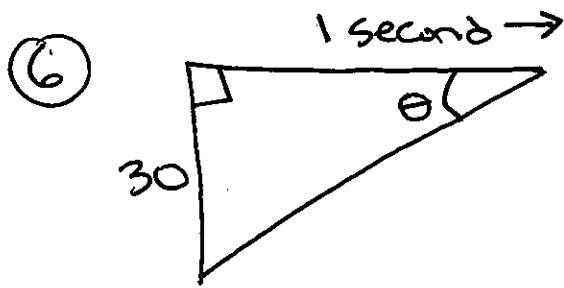$$180 - 90 - 38.7 = B \qquad \boxed{B = 51.3°}$$

⑤
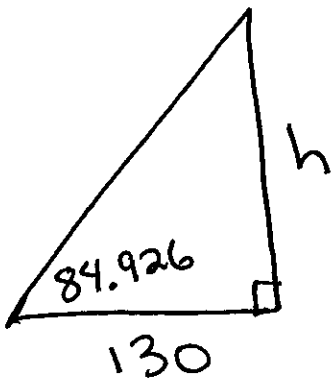
$$\tan 84.926 = \frac{h}{130}$$

$$\boxed{h = 1464.12}$$

8.1 cw day 2

⑥

a) $\tan 16 = \dfrac{30}{x}$ $\boxed{x = 104.62 \text{ ft/sec}}$

$$\dfrac{104.62 \text{ ft}}{1 \text{ second}} \cdot \dfrac{1 \text{ mile}}{5280 \text{ ft}} \cdot \dfrac{60 \text{ sec}}{1 \text{ min}} \cdot \dfrac{60 \text{ min}}{1 \text{ hr}}$$

$$= \boxed{71.3 \text{ miles/hr}}$$

b) $\tan 30 = \dfrac{30}{x}$ $\boxed{x = 51.96 \text{ ft/sec}}$

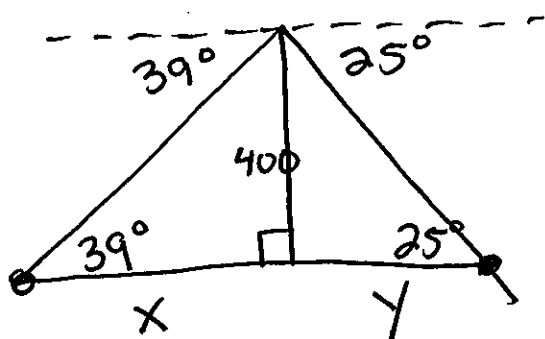*convert to mph

$\boxed{35.4 \text{ miles/hour}}$

8.1 cw day 2

(6) c) ticket 55 + 5 = 60 mph

$$\frac{60 \text{ miles}}{1 \text{ hr}} \cdot \frac{1 \text{ hr}}{60 \text{ min}} \cdot \frac{5280 \text{ ft}}{1 \text{ mile}} \cdot \frac{1 \text{ min}}{60 \text{ sec}}$$

$$= 88 \text{ ft/sec}$$

$$\tan \theta = \frac{30}{88} = \boxed{18.8°}$$

(7)

$$\tan 39 = \frac{400}{x} \qquad x = 493.96$$

$$\tan 25 = \frac{400}{y} \qquad y = 857.80$$

$$\boxed{1351.76}$$