

For full credit you must **show your work** and it must be **neat** and **organized** with answers **simplified** and **boxed** or **circled**. **Units** must be included. **Round to two decimal places** unless otherwise indicated. (5 pts each)

1) Compute and round according to the rounding rules we used in class.

(a)  $\sqrt{120} - 20.0 =$

(b)  $\frac{9.4}{6.8 \pi} =$

(c)  $8.5 - 5.5 | 4.0 - 5.2 | =$

(d)  $1.9 - [(-3.58) - 4.7] + 1.82 =$

(e)  $\frac{3.2 \times 10^3 + 5.1 \times 10^3}{4.8 \times 10^2} =$

2) Fill in the blanks with an appropriate form:

(a) 300 Kilowatts = \_\_\_\_\_ watts

(b) 75 millivolts = \_\_\_\_\_ volts

(c) 5500 meters = \_\_\_\_\_ Kilometers

(d)  $6.2 \times 10^5$  m = \_\_\_\_\_ km.

3) Write using scientific notation:

(a) 3.5 million

(b) 0.00025

(c) 40 thousandths

Write as a decimal number: (a)  $4.7 \times 10^{-3}$

(b)  $6.5 \times 10^4$

4) Compute. **Correct units must be included in your answer.**

(a) A common formula in geometry is:  $x^2 + y^2 = z^2$ . Find x given  $y = 35.0$  cm,  $z = 92.0$  cm

(b) Find the area of a trapezoid.  $A = \frac{a+b}{2} \times h$   $a = 42.5$  cm,  $b = 69.5$  cm,  $h = 19.2$  cm

(c) A common formula in graphing is:  $y = m(x - x_0)$ . Find y given  $x = 17.2''$ ,  $x_0 = 12.4''$ ,  $m = \$7.50/\text{inch}$

5) (a) Round to whole  $64^{\text{ths}}$ : 0.7344

(b) Round to the nearest  $16^{\text{th}}$  inch: 3.4635 ft

Use: 5,280 ft=1 mile 7.48 gal = 1 cu ft 2.54 cm = 1 inch 1.6093 km = 1 mile
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6)  $496.25$  cm = \_\_\_\_ft \_\_\_\_  $\frac{\quad}{16}$  in

7)  $37,000,000$  in<sup>3</sup>/min = ? cfs (cubic feet per second)

8)  $1,000 \frac{\text{cm}}{\text{sec}}$  = ? fps (ft/min)

9) The weight removed from a steel plate is directly proportional to the area cut out. Four 3-inch holes are drilled through a 15" x 10" steel plate weighing 215 lbs.

(a) What amount of weight is removed?

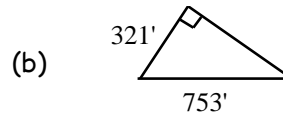
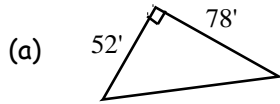
(b) What percentage of weight is removed?

10) An old tachometer is tested and found to read 3690 rpm when it should read 4000 rpm.

(a) What is the absolute error?

(b) What is the relative error?

11) Find in the missing side.



12) Convert  $\theta = -150^\circ$  to its equivalent (a)  $+\theta$ -angle \_\_\_\_\_ (b) Bearing \_\_\_\_\_ (c) azimuth \_\_\_\_\_

Convert N 80° W to its equivalent (d) azimuth \_\_\_\_\_ (e)  $+\theta$ -angle \_\_\_\_\_

You must show your work for credit. The answer alone is insufficient.

13) Solve for x:  $20 - 10(4 - 5x) = 7$

14) Solve for x:  $\frac{3x - 1}{5} = 2x - 10$

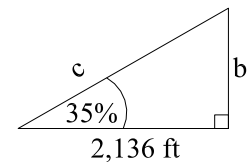
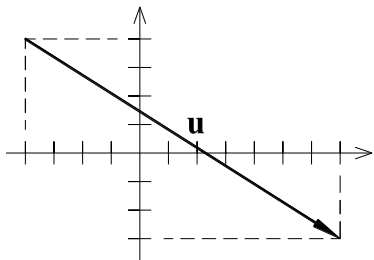
15) Solve for y:  $ax + by = c$

16) Solve for y:  $k = \sqrt{x + y}$

17) (a) Give the slope of **u** as a fraction

(b) Give the slope of 40% as an equivalent pitch (i.e. in/ft)

(c) Find distance **b**



18) A pivot irrigation system with a 420' arm rotates  $300^\circ$ . Find the area (in acres) under irrigation ( $43,560 \text{ ft}^2 = 1 \text{ ac}$ )

19) Give the length of each piece when a  $27' 9 \frac{3}{4}"$  bar is cut into 7 pieces. Give answer as ft-in with  $16^{\text{ths}}$

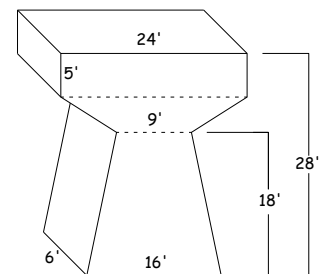
20) (a)  $\frac{2}{3} - \frac{3}{4} =$

(b)  $1\frac{1}{4} - 3\frac{7}{8} =$

(c)  $4\frac{5}{8} \times 2\frac{1}{2} =$

### BONUS

How many cubic yards are needed to create the bridge pier?



KEY

For full credit you must show your work and it must be neat and organized with answers simplified and boxed or circled. Units must be included. Round to two decimal places unless otherwise indicated. (5 pts each)

1) Compute and round according to the rounding rules we used in class.

(a)  $\sqrt{120} - 20.0 = -9.0$  (b)  $\frac{9.4}{6.8\pi} = 0.44$  (c)  $8.5 - 5.5 | 4.0 - 5.2 | = 1.9$

(d)  $1.9 - [(-3.58) - 4.7] + 1.82 = 12.0$  (e)  $\frac{3.2 \times 10^3 + 5.1 \times 10^3}{4.8 \times 10^2} = 17.29... \sim 17$

2) Fill in the blanks with an appropriate form: (multiple correct answers)

(a) 300 Kilowatts = 300,000 watts (b) 75 millivolts = 0.075 volts

(c) 5500 meters = 5.5 Kilometers (d)  $6.2 \times 10^5$  m = 620 km.

3) Write using scientific notation:

(a) 3.5 million  $3.5 \times 10^6$  (b) 0.00025  $2.5 \times 10^{-4}$  (c) 40 thousandths  $4.0 \times 10^{-2}$

Write as a decimal number: (a)  $4.7 \times 10^{-3}$  0.0047 (b)  $6.5 \times 10^4$  65000

4) Compute. Correct units must be included in your answer.

(a) A common formula in geometry is:  $x^2 + y^2 = z^2$ . Find x given y = 35.0 cm, z = 92.0 cm  $x \sim 85.1$

(b) Find the area of a trapezoid.  $A = \frac{a+b}{2} \times h$  a = 42.5 cm, b = 69.5 cm, h = 19.2 cm  
 $1075.2 \text{ cm}^2 \sim 1080 \text{ cm}^2$

(c) A common formula in graphing is:  $y = m(x - x_0)$ . Find y given x = 17.2",  $x_0 = 12.4"$ , m = \$7.50/inch  $y = 35$

5) (a) Round to whole  $64^{\text{ths}}$ : 0.7344  $47/64$  (b) Round to the nearest  $16^{\text{th}}$  inch: 3.4635 ft  $3' 5"$

Use: 5,280 ft=1 mile 7.48 gal = 1 cu ft 2.54 cm = 1 inch 1.6093 km = 1 mile

6) 496.25 cm = 16ft  $3 \frac{6}{16}$  in  $195.374 \text{ in}$

7) 37,000,000 in<sup>3</sup>/min = ? cfs (cubic feet per second) 357 cfs

8)  $1,000 \frac{\text{cm}}{\text{sec}} = ? \text{ fps (ft/min)}$   $\frac{1000 \text{ cm}}{\text{sec}} \frac{60 \text{ sec}}{1 \text{ min}} \frac{1 \text{ in}}{2.54 \text{ cm}} \frac{1 \text{ ft}}{12 \text{ in}} \approx 1969 \text{ fps}$

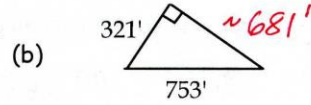
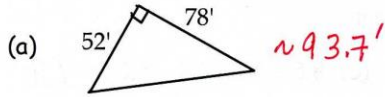
9) The weight removed from a steel plate is directly proportional to the area cut out. Four 3-inch holes are drilled through a 15" x 10" steel plate weighing 215 lbs.

(a) What amount of weight is removed?  $\frac{150 \text{ in}^2}{215 \#} = \frac{4 \cdot (3/2)^2 \cdot \pi}{x}$   $x \approx 40.5 \#$

(b) What percentage of weight is removed?  $\frac{40.5}{215} \approx 18.8\%$

- 10) An old tachometer is tested and found to read 3690 rpm when it should read 4000 rpm.  
 (a) What is the absolute error?  $-310 \text{ rpm}$  (b) What is the relative error?  $-0.0775 = -7.75\%$

11) Find in the missing side.

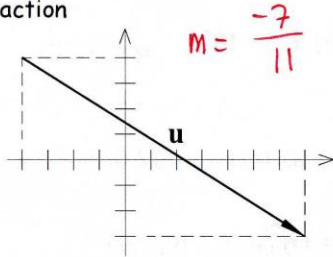


- 12) Convert  $\theta = -150^\circ$  to its equivalent (a)  $+\theta$ -angle  $210^\circ$  (b) Bearing  $S 60^\circ W$  (c) azimuth  $240^\circ$   
 Convert  $N 80^\circ W$  to its equivalent (d) azimuth  $280^\circ$  (e)  $+\theta$ -angle  $170^\circ$

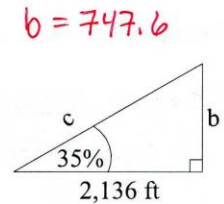
You must show your work for credit. The answer alone is insufficient.

- 13) Solve for x:  $20 - 10(4 - 5x) = 7$   $x = 27/50$  14) Solve for x:  $\frac{3x-1}{5} = 2x - 10$   $x = 7$   
 15) Solve for y:  $ax + by = c$   $y = \frac{c-ax}{b}$  16) Solve for y:  $k = \sqrt{x+y}$   $y = k^2 - x$

- 17) (a) Give the slope of u as a fraction (b) Give the slope of 40% as an equivalent pitch (i.e. in/ft) (c) Find distance b



(b)  $40\% = 4.8/12$



- 18) A pivot irrigation system with a 420' arm rotates  $300^\circ$ . Find the area (in acres) under irrigation  
 ( $43,560 \text{ ft}^2 = 1 \text{ ac}$ )  $461814 \text{ sf} \approx 10.6 \text{ ac}$

19) Give the length of each piece when a  $27' 9 \frac{3}{4}"$  bar is cut into 7 pieces. Give answer as ft-in with  $16^{\text{ths}}$

- 20) (a)  $\frac{2}{3} - \frac{3}{4} = \frac{-1}{12}$  (b)  $1\frac{1}{4} - 3\frac{7}{8} = -2\frac{5}{8}$  (c)  $4\frac{5}{8} \times 2\frac{1}{2} = 11\frac{9}{16}$

BONUS

How many cubic yards are needed to create the bridge pier?

$2565 \text{ ft}^3 \approx 95 \text{ yd}^3$

