

Basic Mathematics
Final Review

Directions: Place all work and answers on this test. Be sure to write neatly and circle your answers when possible.

1. $4\frac{1}{4} \div \frac{1}{2}$

2. $12\frac{3}{5} - 3\frac{3}{4}$

3. $3\frac{1}{7} \times 2\frac{4}{5}$

4. $\frac{19}{24} + \frac{5}{16}$

5. 3.85×0.2

6. $\frac{8}{9} - \frac{3}{5}$

7. Change $\frac{18}{22}$ to percent. Round answer to the nearest hundredth.

8. 23.5 is 130% of what number? Round answer to the nearest hundredth.

9. What percent of 200 is 4?

10. Find 15% of \$15.

11. Change $\frac{4}{5}$ to a decimal.

12. Change 12.5% to a fraction and simplify.

13. Change 0.14 to a fraction in lowest terms.

14. In the primary election in Conrad, 804 voters were registered, but only 201 people voted. What percent of the registered voters voted in the primary? Round answer to the nearest tenth of a percent.

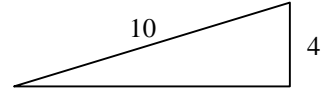
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15. A ramp 10ft long is connected to the back of a truck that is 4ft off the ground. How far away from the truck does the ramp touch the ground?

(a) 84 ft

(b) $\sqrt{84}\text{ ft}$

(c) $\sqrt{116}\text{ ft}$



16. Solve for n. $\frac{43\text{gallons}}{10\text{hours}} = \frac{n\text{ gallons}}{4\text{hours}}$

17. Evaluate exactly: $\sqrt{100} - \sqrt{36}$

18. Emma designed a triangular flowerbed with a base of 45 feet and a height of 15 feet. Fertilizer costs \$0.85 per square foot. How much will it cost Emma to fertilize her flowerbed?

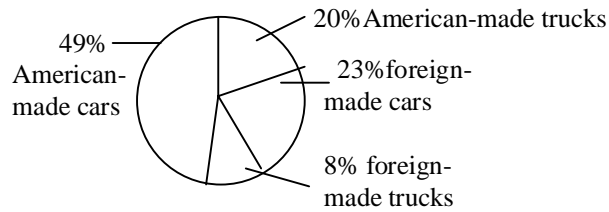
19. You have just finished a great meal at La Taqueria Mexicana and the bill was \$16.75 with tax. If you leave a 15% tip for the waitress, what will the total cost of the meal be?

20. Juan had \$3000 in his savings account. A year later, he had \$4000 because interest accrued on his savings. Find the percent increase.

21. A boat travel 5 miles due south and then 11 miles due east. How far is it from the starting point?
Round answer to the nearest tenth.

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22. The circle graph indicates the results of a survey of 200 car and truck owners. How many own a truck?



23. Solve for x . $\frac{9.2}{0.2} = \frac{16.1}{x}$

24. Find the length of the hypotenuse of a right triangle whose legs are 3 cm and 2 cm. Round answer to the nearest thousandth.

25. What is the measure of the width of a rectangle whose length measures 4 inches and whose diagonal measures 8 inches? Round answer to the nearest hundredth.

26. Find the circumference of a circle whose diameter is 12 cm. Use $\pi = 3.14$.

27. Evaluate $\sqrt{18}$ to the nearest thousandth.

28. $\sqrt{39}$ lies between what two integers?

29. 47 lies between what two perfect squares?

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30. Place the following numbers in order from least to greatest.

$$1.9, \frac{3}{4}, 0.23, 1\frac{1}{2}$$

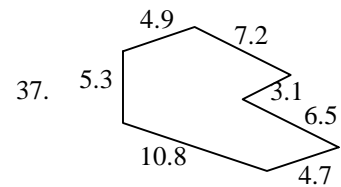
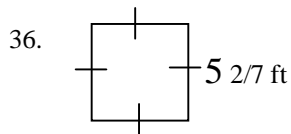
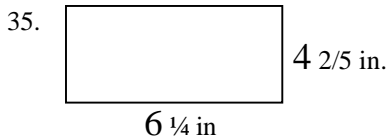
31. Find h when $t=5$: $h = 4.9 t^2$

32. Find r when $D = 306$ and $t = 9$: $D = rt$

33. Find F_1 when $F_2 = 6$, $D_1 = 8$, and $D_2 = 4$: $F_1 \times D_1 = F_2 \times D_2$

34. Find F when $m = 15.7$ and $a = 72.9$: $F = m \times a$

For problems 35-37, find the perimeter.



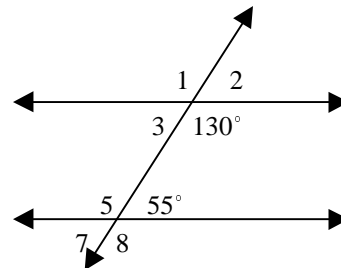
For problems 38-41, use the figure to the right.

38. Find the measure of $\angle 3$.

39. Find the measure of $\angle 5$.

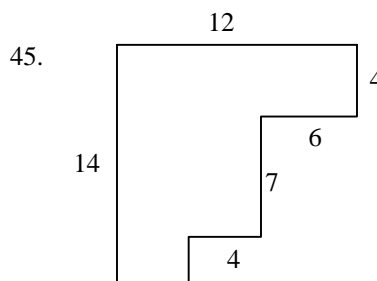
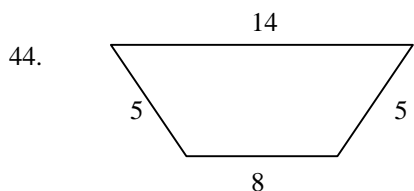
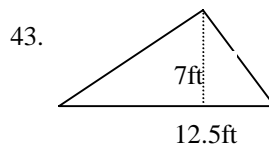
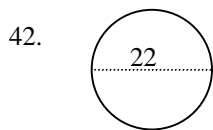
40. Name an angle supplementary to $\angle 1$.

41. Are the lines parallel?

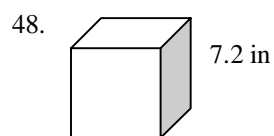
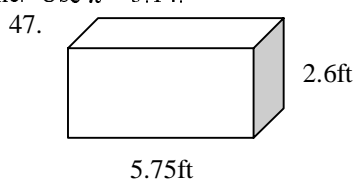
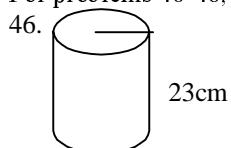


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For problems 42-45, find the area. Use $\pi = 3.14$.



For problems 46-48, find the volume. Use $\pi = 3.14$.



For problems 49 and 50, perform the indicated operations.

49. $9 + (-3) - 7$

50. $4 * 12/2 + 3(7 - 2)$

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SOLUTIONS

Directions: Place all work and answers on this test. Be sure to write neatly and circle your answers when possible.

1. $4\frac{1}{4} \div \frac{1}{2}$
 $\frac{17}{4} \times \frac{2}{1}$
 $\frac{34}{4}$
 $\frac{17}{2}$ or $8\frac{1}{2}$

2. $12\frac{3}{5} - 3\frac{3}{4}$
 $12\frac{12}{20} - 3\frac{15}{20}$
 $11\frac{32}{20} - 3\frac{15}{20}$
 $8\frac{17}{20}$

3. $3\frac{1}{7} \times 2\frac{4}{5}$
 $\frac{22}{7} \times \frac{14}{5}$
 $\frac{22}{1} \times \frac{2}{5}$
 $\frac{44}{5}$ or $8\frac{4}{5}$

4. $\frac{19}{24} + \frac{5}{16}$
 $\frac{38}{48} + \frac{15}{48}$
 $\frac{53}{48}$ or $1\frac{5}{48}$

5. 3.85×0.2
 0.77

6. $\frac{8}{9} - \frac{3}{5}$
 $\frac{40}{45} - \frac{27}{45}$
 $\frac{13}{45}$

7. Change $\frac{18}{22}$ to percent. Round answer to the nearest hundredth.

$$18 \div 22 \approx 0.8181818 \approx 81.81818\% \approx 81.82\%$$

8. 23.5 is 130% of what number? Round answer to the nearest hundredth.

$$23.5 = 1.30 \times n$$

$$\frac{23.5}{1.30} = \frac{1.30n}{1.30}$$

$$18.08 = n$$

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9. What percent of 200 is 4?

$$n \times 200 = 4$$

$$\frac{n \times 200}{200} = \frac{4}{200}$$

$$n = 0.02$$

$$n = 2\%$$

10. Find 15% of \$15.

$$15\% \times \$15$$

$$0.15 \times \$15$$

$$\$2.25$$

11. Change $\frac{4}{5}$ to a decimal.

$$4 \div 5 = 0.8$$

12. Change 12.5% to a fraction and simplify.

$$12.5\% = 0.125 = \frac{125}{1000} = \frac{1}{8}$$

13. Change 0.14 to a fraction in lowest terms.

$$0.14 = \frac{14}{100} = \frac{7}{50}$$

14. In the primary election in Conrad, 804 voters were registered, but only 201 people voted. What percent of the registered voters voted in the primary? Round answer to the nearest tenth of a percent.

$$n \times 804 = 201$$

$$\frac{n \times 804}{804} = \frac{201}{804}$$

$$n = 0.25$$

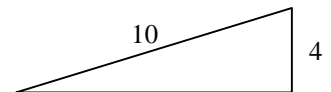
$$n = 25\%$$

15. A ramp 10ft long is connected to the back of a truck that is 4ft off the ground. How far away from the truck does the ramp touch the ground?

(a) 84 ft

(b) $\sqrt{84}$ ft

(c) $\sqrt{116}$ ft



$$(leg)^2 + (leg)^2 = (hypotenuse)^2$$

$$4^2 + (leg)^2 = 10^2$$

$$16 + (leg)^2 = 100$$

$$(leg)^2 = 84$$

$$leg = \sqrt{84}$$

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16. Solve for n. $\frac{43\text{gallons}}{10\text{hours}} = \frac{n \text{ gallons}}{4\text{hours}}$

$$10n = 43 \times 4$$

$$10n = 172$$

$$\frac{10n}{10} = \frac{172}{10}$$

$$n = 17.2$$

17. Evaluate exactly: $\sqrt{100} - \sqrt{36}$

$$\sqrt{100} - \sqrt{36}$$

$$10 - 6$$

$$4$$

18. Emma designed a triangular flowerbed with a base of 45 feet and a height of 15 feet. Fertilizer costs \$0.85 per square foot. How much will it cost Emma to fertilize her flowerbed?

$$A = \frac{1}{2} \times \text{base} \times \text{height}$$

$$A = \frac{1}{2} \times 45 \times 15$$

$$A = \frac{1}{2} \times 675$$

$$A = 337.5 \text{sq. ft.}$$

$$\text{Cost} = \text{price} \times \text{sq. ft.}$$

$$\text{Cost} = \$0.85 \times 337.5$$

$$\text{Cost} = \$286.88$$

19. You have just finished a great meal at La Taqueria Mexicana and the bill was \$16.75 with tax. If you leave a 15% tip for the waitress, what will the total cost of the meal be?

$$\text{total price} = \text{meal} + \text{tip}$$

$$tp = \$16.75 + \$2.51$$

$$tp = \$19.26$$

$$\text{tip} = 15\% \text{ of meal}$$

$$\text{tip} = 0.15 \times \$16.75$$

$$\text{tip} = \$2.5125$$

$$\text{tip} = \$2.51$$

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20. Juan had \$3000 in his savings account. A year later, he had \$4000 because interest accrued on his savings. Find the percent increase.

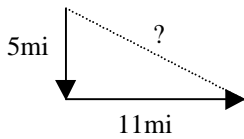
$$\text{percent of increase} = \frac{\text{increase}}{\text{original}} \times 100$$

$$\text{percent of increase} = \frac{1000}{3000} \times 100$$

$$\text{percent of increase} = \frac{1}{3} \times 100$$

$$\text{percent of increase} = 33.\bar{3}\%$$

21. A boat travel 5 miles due south and then 11 miles due east. How far is it from the starting point?
Round answer to the nearest tenth.



$$a^2 + b^2 = c^2$$

$$5^2 + 11^2 = c^2$$

$$25 + 121 = c^2$$

$$146 = c^2$$

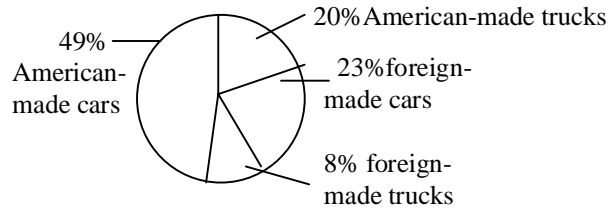
$$\sqrt{146} = \sqrt{c^2}$$

$$\sqrt{146} = c$$

$$12.1 \approx c$$

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22. The circle graph indicates the results of a survey of 200 car and truck owners. How many own a truck?



% of Truck owners = % of American trucks + % of Foreign trucks

% of Truck owners = 20% + 8%

% of Truck owners = 28%

28% of 200 = # of truck owners

$0.28 \times 200 = \# \text{ of truck owners}$

56 = # of truck owners

23. Solve for x. $\frac{9.2}{0.2} = \frac{16.1}{x}$

$$9.2x = 0.2 \times 16.1$$

$$9.2x = 3.22$$

$$\frac{9.2x}{9.2} = \frac{3.22}{9.2}$$

$$x = 0.35$$

24. Find the length of the hypotenuse of a right triangle whose legs are 3 cm and 2 cm. Round answer to the nearest thousandth.

$$(\text{leg})^2 + (\text{leg})^2 = (\text{hypotenuse})^2$$

$$3^2 + 2^2 = (\text{hyp})^2$$

$$9 + 4 = (\text{hyp})^2$$

$$13 = (\text{hyp})^2$$

$$\sqrt{13} = \sqrt{(\text{hyp})^2}$$

$$\sqrt{13} = \text{hyp}$$

$$3.60555 \approx \text{hyp}$$

$$3.606 \approx \text{hyp}$$

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25. What is the measure of the width of a rectangle whose length measures 4 inches and whose diagonal measures 8 inches? Round answer to the nearest hundredth.

$$(\text{leg})^2 + (\text{leg})^2 = (\text{hypotenuse})^2$$

$$4^2 + (\text{leg})^2 = 8^2$$

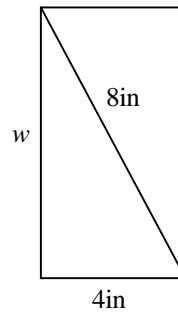
$$16 + (\text{leg})^2 = 64$$

$$(\text{leg})^2 = 48$$

$$\text{leg} = \sqrt{48}$$

$$\text{leg} \approx 6.928$$

$$\text{width} \approx 6.93\text{in.}$$



26. Find the circumference of a circle whose diameter is 12 cm. Use $\pi = 3.14$.

$$C = \pi \cdot d$$

$$C = 3.14 \cdot 12$$

$$C = 37.68\text{cm}$$

27. Evaluate $\sqrt{18}$ to the nearest thousandth.

$$\sqrt{18} \approx 4.2426 \approx 4.243$$

28. $\sqrt{39}$ lies between what two integers?

$$\sqrt{36} = 6 \text{ \& } \sqrt{49} = 7$$

$$\sqrt{39} \text{ lies between } 6 \text{ \& } 7$$

29. 47 lies between what two perfect squares?

36 is a perfect square of 6 and

49 is a perfect square of 7

$$36 < 47 < 49$$

30. Place the following numbers in order from least to greatest.

$$1.9, \frac{3}{4}, 0.23, 1\frac{1}{2}$$

$$\frac{3}{4} = .75$$

$$.23 < .75 < 1.5 < 1.9$$

$$1\frac{1}{2} = 1.5$$

$$\text{answer: } .23, .75, 1.5, 1.9$$

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31. Find h when $t=5$: $h = 4.9 t^2$

$$h = 4.9t^2$$

$$h = 4.9(5)^2$$

$$h = 4.9 \cdot 25$$

$$h = 122.5$$

32. Find r when $D = 306$ and $t = 9$: $D = rt$

$$D = rt$$

$$306 = r \cdot 9$$

$$\frac{306}{9} = \frac{r \cdot 9}{9}$$

$$34 = r$$

33. Find F_1 when $F_2 = 6$, $D_1 = 8$, and $D_2 = 4$: $F_1 \times D_1 = F_2 \times D_2$

$$F_1 \times 8 = 6 \times 4$$

$$F_1 \times 8 = 24$$

$$\frac{F_1 \times 8}{8} = \frac{24}{8}$$

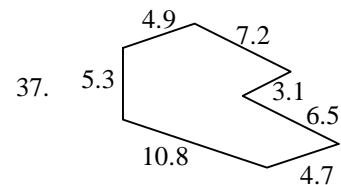
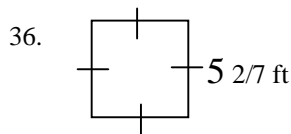
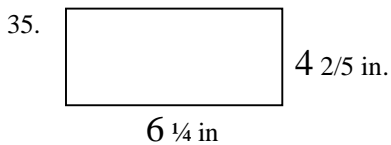
$$F_1 = 3$$

34. Find F when $m = 15.7$ and $a = 72.9$: $F = m \times a$

$$F = 15.7 \cdot 72.9$$

$$F = 1144.53$$

For problems 35-37, find the perimeter.



Perimeter is the sum of all the sides.

$$P = 6 \frac{1}{4} + 4 \frac{2}{5} + 6 \frac{1}{4} + 4 \frac{2}{5}$$

$$P = 6.25 + 4.4 + 6.25 + 4.4$$

$$P = 21.3 \text{ in.}$$

$$P = 4 \times 5 \frac{2}{7}$$

$$P = 4 \times \frac{37}{7}$$

$$P = \frac{148}{7} \text{ or } 21 \frac{1}{7} \text{ ft.}$$

$$P = 5.3 + 4.9 + 7.2 + 3.1 +$$

$$6.5 + 4.7 + 10.8$$

$$P = 42.5$$

For problems 38-41, use the figure to the right.

38. Find the measure of $\angle 3$.

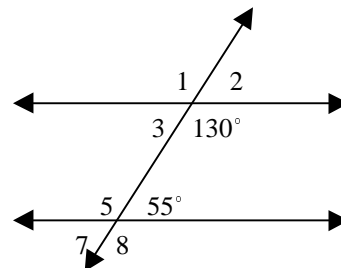
$$\angle 3 + 130^\circ = 180^\circ$$

$$\angle 3 = 50^\circ$$

39. Find the measure of $\angle 5$.

$$\angle 5 + 55^\circ = 180^\circ$$

$$\angle 5 = 125^\circ$$

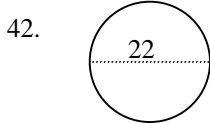


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40. Name an angle supplementary to $\angle 1$.
 $\angle 2$ is supplementary to $\angle 1$.

41. Are the lines parallel?
The lines are NOT parallel.
If they were parallel then $\angle 5$ would equal 130° and $\angle 3$ would equal 55° .

For problems 42-45, find the area. Use $\pi = 3.14$.



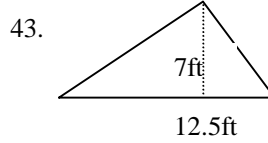
Diameter = 22
Radius = 11

$$A = \pi r^2$$

$$A = 3.14 \cdot 11^2$$

$$A = 3.14 \cdot 121$$

$$A = 379.94 \text{ sq.in.}$$

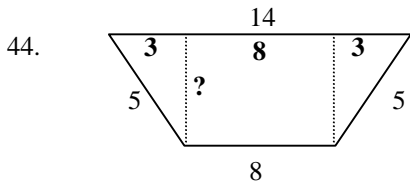


$$A = \frac{1}{2} \times \text{base} \times \text{height}$$

$$A = \frac{1}{2} \times 12.5 \times 7$$

$$A = 0.5 \times 87.5$$

$$A = 43.75 \text{ sq.ft.}$$



$$A = \frac{1}{2} \times \text{height} \times (b_1 + b_2)$$

$$A = 0.5 \times 4 \times (14 + 8)$$

$$A = 2 \times 22$$

$$A = 44$$

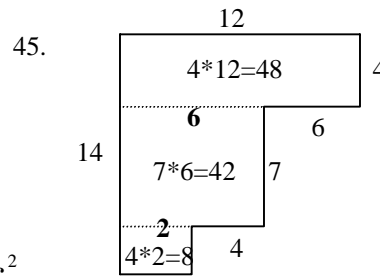
$$a^2 + b^2 = c^2$$

$$3^2 + b^2 = 5^2$$

$$9 + b^2 = 25$$

$$b^2 = 16$$

$$b = 4$$



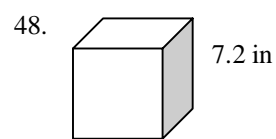
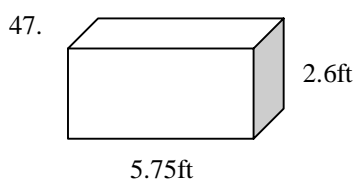
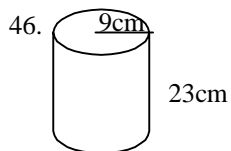
$$A = \text{area1} + \text{area2} + \text{area3}$$

$$A = 48 + 42 + 8$$

$$A = 98$$

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For problems 46-48, find the volume. Use $\pi = 3.14$.



$$V = (\text{base area}) \times \text{height}$$

$$V = (\pi r^2) \times \text{height}$$

$$V = (3.14 \cdot 9^2) \times 23$$

$$V = (3.14 \cdot 81) \cdot 23$$

$$V = 254.34 \cdot 23$$

$$V = 5849.82 \text{cm}^3$$

$$V = \text{length} \times \text{width} \times \text{height}$$

$$V = 5.75 \times 2.6 \times 2.6$$

$$V = 38.87 \text{ft}^3$$

$$V = lwh$$

$$V = 7.2 \cdot 7.2 \cdot 7.2$$

$$V = 373.248 \text{in}^3$$

For problems 49 and 50, perform the indicated operations.

49. $9 + (-3) - 7$

$$9 - 3 - 7$$

$$6 - 7$$

$$-1$$

50. $4 * 12/2 + 3(7 - 2)$

$$4 * 6 + 3(5)$$

$$24 + 15$$

$$39$$