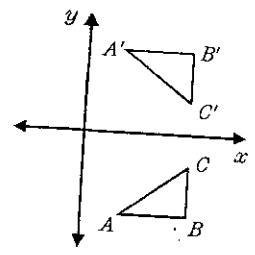


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1. In the diagram above, $\triangle ABC \sim \triangle A'B'C'$. Under which type of transformation is $\triangle A'B'C'$ the image of $\triangle ABC$?

- A. a line reflection
- B. a rotation
- C. a translation
- D. a dilation



2. What is the image of $(4, -1)$ after a dilation of 2?

- A. $(6, 1)$
- B. $(2, -3)$
- C. $(6, -1)$
- D. $(8, -2)$

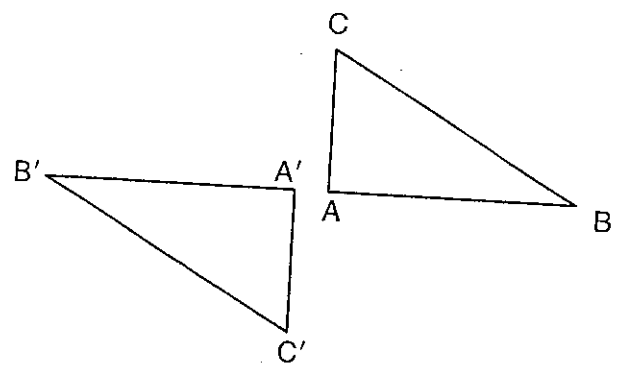
3. The point $(-2, 1)$ is rotated 180° about the origin in a clockwise direction. What are the coordinates of its image?

$(2, -1)$

4. Which mapping represents a dilation?

- A. $(x, y) \rightarrow (y, x)$
- B. $(x, y) \rightarrow (x + 2, y + 2)$
- C. $(x, y) \rightarrow (-y, -x)$
- D. $(x, y) \rightarrow (2x, 2y)$

5. In the diagram below, under which transformation will $\triangle A'B'C'$ be the image of $\triangle ABC$?



- A. rotation
- B. dilation
- C. translation
- D. glide reflection

6. A translation maps $A(4, 1)$ onto $A'(6, 6)$. Find the coordinates of the image of $B(-1, 0)$ under the same translation.

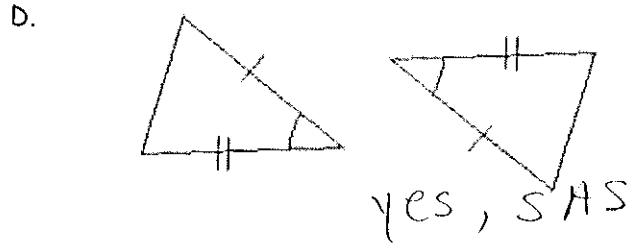
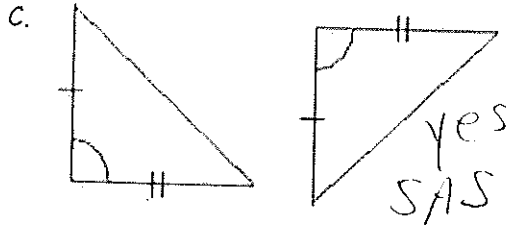
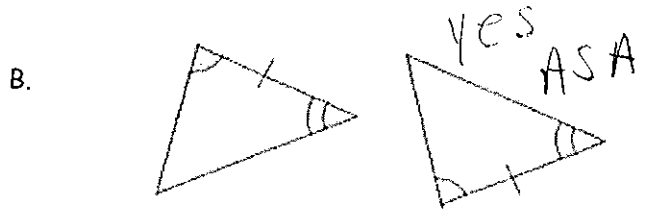
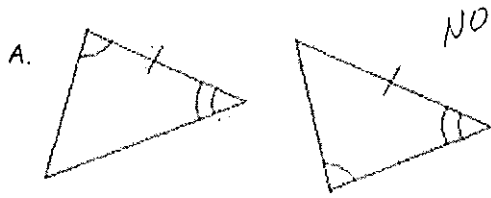
$(1, 5)$

7. If $A = (-2, 3)$, what is $r_{y\text{-axis}} \circ D_3(A)$?

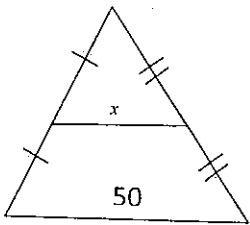
- A. $(-6, -9)$
- B. $(9, -6)$
- C. $(5, 6)$
- D. $(6, 9)$

8) If $\triangle ABC \cong \triangle XYZ$, then $\overline{AB} \cong \overline{XY}$, $\angle B \cong \angle Y$, AND $\overline{XZ} \cong \overline{AC}$

9) Why is each pair congruent or not congruent?

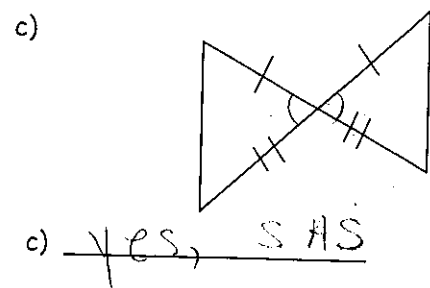
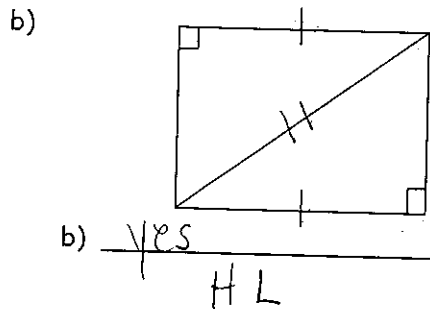
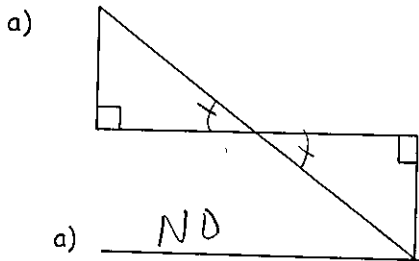


10) Solve for x.

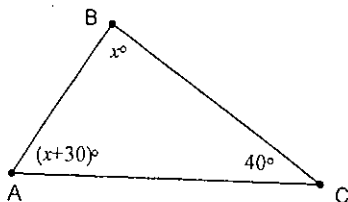


3) 25

11) State whether each triangle is congruent or not. If they are state which postulate or theorem that proves they are congruent.



12) Find $m\angle ABC$:



$$x + 40 + x + 30 = 180$$

$$\begin{array}{r} 2x + 70 = 180 \\ -70 \quad -70 \\ \hline \end{array}$$

$$\frac{2x}{2} = \frac{110}{2}$$

$$x = 55$$

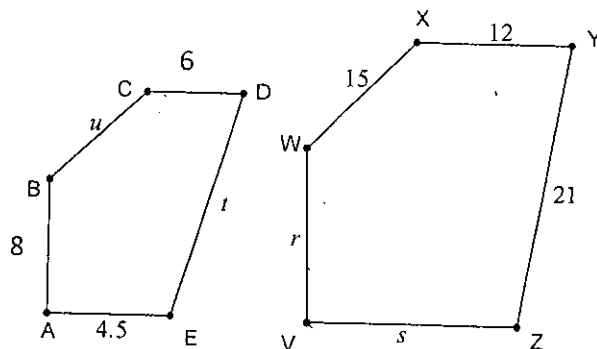
8) _____

13) If $ABCDE \sim VWXYZ$, then:

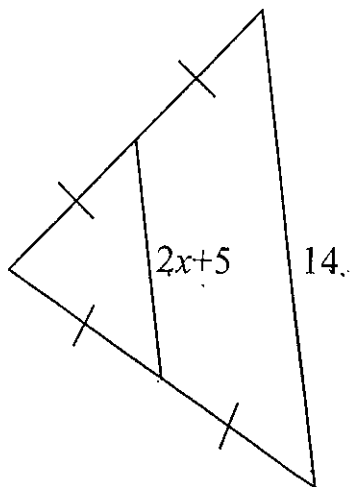
(a) Find the scale factor of $ABCDE$ to $VWXYZ$. 2

(b) Find the values of r and s .

$$r = \frac{16}{9}$$



14) Solve for X in the following picture.



$$\begin{array}{r} 2x + 5 = 7 \\ -5 \quad 5 \\ \hline \end{array}$$

$$2x = 2$$

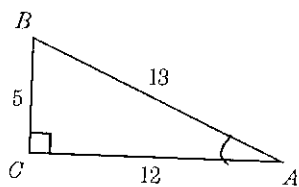
$$\boxed{x = 1}$$

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- 15 In the accompanying diagram of right triangle ABC , $AC = 12$, $AB = 13$, and $BC = 5$. What is the value of $\sin A - \cos A$?

- A. $\frac{7}{13}$
 B. $-\frac{7}{13}$
 C. $\frac{17}{13}$
 D. $-\frac{17}{13}$

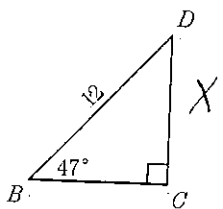


$$\sin A = \frac{5}{13}$$

$$\cos A = \frac{12}{13}$$

$$\frac{5}{13} - \frac{12}{13} = \boxed{-\frac{7}{13}}$$

- 16 In right triangle BCD , $BD = 12$, $m\angle C = 90$, and $m\angle DBC = 47$. Find DC to the nearest tenth.



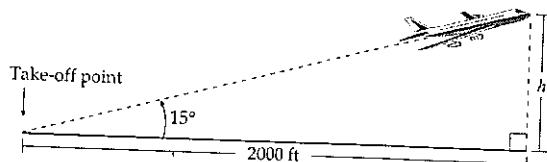
8.8

$$\sin 47 = \frac{x}{12}$$

$$12(\sin 47) \approx 8.8$$

*calc mode must be in degrees

- 17 An airplane makes a 15° angle of elevation from the runway when it takes off. The airplane pictured below is 2,000 feet along the ground from its take-off point.



Note: The figure is not drawn to scale.

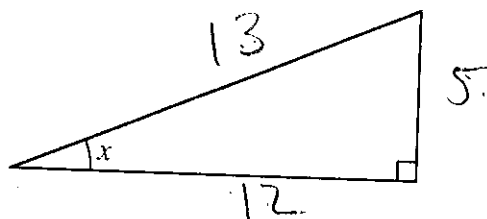
At what height (h) is the airplane? Round the answer to the nearest foot.

- A. 500 feet
 B. 518 feet
 C. 536 feet
 D. 550 feet

$$\tan 15 = \frac{h}{2000}$$

$$2000(\tan 15) = h = 535.944$$

- 18 In the figure below, if $\sin x = \frac{5}{13}$, what are $\cos x$ and $\tan x$?



A) $\cos x = \frac{12}{13}$ and $\tan x = \frac{5}{12}$

B. $\cos x = \frac{12}{13}$ and $\tan x = \frac{12}{5}$

C. $\cos x = \frac{13}{12}$ and $\tan x = \frac{5}{12}$

D. $\cos x = \frac{13}{12}$ and $\tan x = \frac{13}{5}$

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

$$5^2 + b^2 = 13^2$$

$$-25$$

$$-25$$

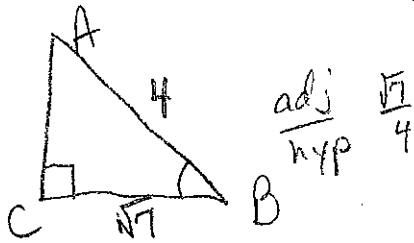
$$b^2 = 144$$

$$b = 12$$

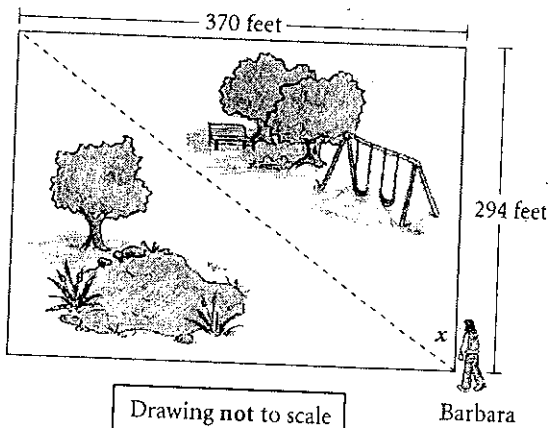
4

19. In $\triangle ABC$ where C is a right angle, $\sin A = \frac{\sqrt{7}}{4}$.
What is $\cos B$?

- A. $\frac{\sqrt{7}}{4}$ B. $\frac{\sqrt{7}}{3}$ C. $\frac{3}{4}$ D. $\frac{3}{\sqrt{7}}$



20. Barbara went for a walk in the city park. To cut across the rectangular park, she chose the path shown by the dotted line in the drawing below.



At what angle, x , did Barbara cut across the park?
Round the answer to the nearest tenth of a degree.

- A. 37.4 B. 38.5 C. 51.5 D. 52.6

$$\tan x = \frac{370}{294}$$

$$\tan^{-1}\left(\frac{370}{294}\right) = 51.5^\circ$$

21. What is the solution to the equation shown?

$$\sqrt{3x-1} = 8$$

- A. 3 B. $\frac{17}{3}$ C. $\frac{65}{3}$ D. 27

$$3x-1 = 8^2$$

$$3x-1 = 64$$

$$3x = 65$$

$$x = \frac{65}{3}$$

22. What are the roots of the equation $x^2 - 5x + 6 = 0$?

- A. 1 and -6 B. 2 and 3
C. -1 and 6 D. -2 and -3

$$x^2 - 5x + 6 = 0$$

$$(x-3)(x-2) = 0$$

$$x = 3, x = 2$$

23. Solve: $\frac{5}{n+2} = \frac{3}{2n}$

- A. $\left\{\frac{6}{7}\right\}$ B. $\left\{\frac{2}{7}\right\}$ C. $\left\{\frac{2}{13}\right\}$ D. $\left\{\frac{7}{6}\right\}$

$$5(2n) = 3(n+2)$$

$$10n = 3n + 6$$

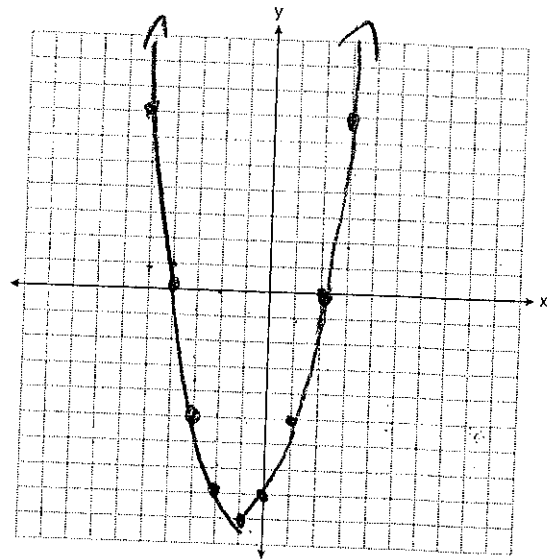
$$\frac{-3n}{-3n} \quad \frac{-3n}{-3n}$$

$$7n = 6$$

$$n = \frac{6}{7}$$

24. On the set of axes below, graph the equation $y = x^2 + 2x - 8$.

Using the graph, determine and state the roots of the equation $x^2 + 2x - 8 = 0$.



$$(2, -4)$$

25 What is the value of x

$$3\sqrt{9+x} = 15$$

- A. -4 B. 6 C. 16 D. 36

$$3\sqrt{9+x} = 15$$

$$\sqrt{9+x} = 5$$

$$(\sqrt{9+x})^2 = 5^2$$

$$9+x = 25$$

$$\begin{array}{r} 9+x = 25 \\ -9 \quad -9 \\ \hline \end{array}$$

$$x = 16$$

26 Use the quadratic equation to solve the following:

$$3x^2 + 8x + 4 = 0$$

$$\left(-2, -\frac{2}{3}\right)$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$a = 3, b = 8, c = 4$$

$$x = \frac{-8 \pm \sqrt{8^2 - 4(3)(4)}}{2(3)}$$

$$x = \frac{-8 \pm \sqrt{64 - 48}}{6}$$

$$x = \frac{-8 \pm \sqrt{16}}{6} = \frac{-8 \pm 4}{6}$$

$$x = \frac{-8+4}{6} = \frac{-4}{6} = \frac{-2}{3} \quad x = \frac{-8-4}{6} = \frac{-12}{6} = -2$$

27 Katie performed the steps shown below to solve a quadratic equation using the method of completing the square.

$$\text{Step 1: } x^2 + 4x - 6 = 0$$

$$\text{Step 2: } x^2 + 4x = 6$$

Which represents the next correct step Katie should perform?

- A. $x^2 + 4x + 2 = 6 - 2$ B. $x^2 + 4x + 4 = 6 - 4$
 C. $x^2 + 4x + 2 = 6 + 2$ D. $x^2 + 4x + 4 = 6 + 4$

$$x^2 + 4x + \boxed{} = 6 + \boxed{}$$

$$x^2 + 4x + 4 = 6 + 4$$

28 The roots of the equation $x^2 - 14x + 48 = 0$ are

- A. -6 and -8 B. -6 and 8
 C. 6 and -8 D. 6 and 8

$$(x - 6)(x - 8) = 0$$

$$\begin{array}{l|l} x - 6 = 0 & x - 8 = 0 \\ +6 & +8 \\ \hline & \end{array}$$

$$\boxed{x = 6}$$

$$\boxed{x = 8}$$

Final Exam Review Questions

29. The graph of $f(x) = x^2$ will be translated 2 units down and 5 units to the right. Write the quadratic function, in standard form, that describes the translation.

$$f(x) = (x - 5)^2 - 2$$

30. Identify the asymptotes of the function: $f(x) = \frac{-4}{x+3} - 2$

$$x = -3 \quad y = -2$$

31. Write an equation for the translation of $y = \frac{4}{x}$ that has the asymptotes $x = 7$ and $y = 6$.

$$y = \frac{4}{x-7} + 6$$

32. The function $f(x) = \frac{85}{x}$ models the volume of gas in a balloon under x units of pressure at a constant temperature. Describe the domain, using inequality notation.

$$x > 0$$

33. When a number is added *inside* the radical, the graph shifts up. (True/False)

shifts left

34. The graph of $g(x) = -\sqrt[3]{x}$ will be translated 3 units down and 5 units to the left. Write the function that describes the graph produced by the translation.

$$g(x) = -\sqrt[3]{x+5} - 3$$

35. When a number is subtracted *outside* the radical, the graph shifts left. (True/False)

shifts down

36. If the probability of a team winning is 0.64, what is the probability of the team not winning?

$$1 - 0.64 = 0.36$$

7