

**Proportions, Pythagorean, Midpoint, and Distance Review**

Write the equation. Don't forget to check your solution!

1.  $\frac{x}{2} = \frac{y}{3}$

$\frac{3x}{2} = \frac{2y}{3}$

$9x = 4y$

2.  $\sqrt{x+1}$

$y^2 = x+1$

$(y-1)(y+1) = x+1$

$y = 1, -1$

3.  $\frac{1}{2} = \frac{a+1}{3}$

$3 = 2(a+1)$

$3 = 2a + 2$

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

4. \_\_\_\_\_

5. \_\_\_\_\_

6. \_\_\_\_\_

7.  $\frac{x}{2} = \frac{y+1}{3}$

$3(x-1) = 2(y+1)$

$3x - 3 = 2y + 2$

$3x = 2y + 5$

$x = \frac{2y+5}{3}$

$x = 1, 2$

$x = 1, 2$

8.  $\frac{x+1}{2} = \frac{y}{3}$

$3(x+1) = 2y$

$3x + 3 = 2y$

$3x = 2y - 3$

$x = \frac{2y-3}{3}$

$x = 1, 2$

$x = 1, 2$

9.  $\frac{x+1}{2} = \frac{y}{3}$

$3(x+1) = 2y$

$3x + 3 = 2y$

$3x = 2y - 3$

$x = \frac{2y-3}{3}$

$x = 1, 2$

$x = 1, 2$

10.  $\frac{x+1}{2} = \frac{y}{3}$

$3(x+1) = 2y$

$3x + 3 = 2y$

$3x = 2y - 3$

$x = \frac{2y-3}{3}$

$x = 1, 2$

$x = 1, 2$

11. \_\_\_\_\_

12. \_\_\_\_\_

13. \_\_\_\_\_

14. \_\_\_\_\_

15. \_\_\_\_\_

16. \_\_\_\_\_

17. \_\_\_\_\_

**Pythagorean Theorem**

Write a formula for the Pythagorean Theorem:  $a^2 + b^2 = c^2$

where  $a$ ,  $b$ , and  $c$  are the lengths of the legs and  $c$  is the length of the hypotenuse.



Find the missing length of the right triangle if  $a$  and  $b$  are the lengths of the legs and  $c$  is the length of the hypotenuse. If answers are not exact, round them to the nearest tenth.

18.  $a^2 + b^2 = c^2$   
 $3^2 + 4^2 = 5^2$   
 $9 + 16 = 25$   
 $25 = 25$   
 $c = 5$

19.  $a^2 + b^2 = c^2$   
 $5^2 + 12^2 = 13^2$   
 $25 + 144 = 169$   
 $169 = 169$   
 $c = 13$

20.  $a^2 + b^2 = c^2$   
 $8^2 + 15^2 = 17^2$   
 $64 + 225 = 289$   
 $289 = 289$   
 $c = 17$

21.  $\frac{\sqrt{10}}{10}$   
22.  $\frac{\sqrt{5}}{5}$   
23.  $\frac{1}{2}$