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**Math\_Questions\_0013**

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Section 11.7: Solving Quadratic Equations by Factoring

Section 11.8: Applications of Quadratic Equations

For problems 1 -6, solve the equations by the principle of zero products

1. a)  $(x+2)(x-7)=0$

Solution:

b)  $(x-13)(x+53)=0$

Solution:

2. a)  $(x+6)(x-8)=0$

Solution:

b)  $y(y+5)=0$

Solution:

3. a)  $0=x(x-19)$

Solution:

b)  $(2x+9)(x+8)=0$

Solution:

4. a)  $(4x+9)(14x-7)=0$

Solution:

b)  $(13x+14)(6x-5)=0$

Solution:

5. a)  $55x(8x-9)=0$

Solution:

b)  $\left(\frac{7}{4}x - \frac{1}{16}\right)\left(\frac{2}{3}x - \frac{16}{15}\right) = 0$

Solution:

6. a)  $(0.1x+0.3)(0.4x-20)=0$

Solution:

b)  $(x+5)(x-75)(5x-1)=0$

Solution:

For problems 7 - 14, solve the equations by factoring and using the principle of zero products. Please show a complete solution to each problem.

(In order to get the correct answer, you can check it with the original equation)

7. a)  $x^2 + 7x + 6 = 0$

Solution:

b)  $x^2 + 4x - 21 = 0$

Solution:

8. a)  $x^2 - 9x + 14 = 0$

Solution:

b)  $x^2 - 3x = 0$

Solution:

9. a)  $x^2 + 16x = 0$

Solution:

b)  $100 = x^2$

Solution:

10. a)  $4x^2 - 9 = 0$

Solution:

b)  $0 = 25 + x^2 + 10x$

Solution:

11. a)  $1 + x^2 = 2x$

Solution:

b)  $7x^2 = 8x$

Solution:

12. a)  $3x^2 - 7x = 20$

Solution:

b)  $2y^2 + 12y = -10$

Solution:

13. a)  $x(x-5) = 14$

Solution:

b)  $64a^2 = 81$

Solution:

14. a)  $3x^2 + 8x = 9 + 2x$

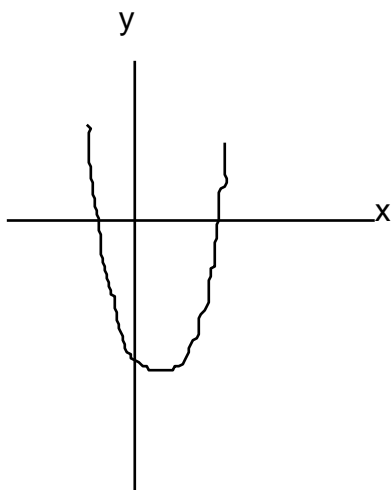
Solution:

b)  $12x^2 + 17x - 5 = 0$

Solution:

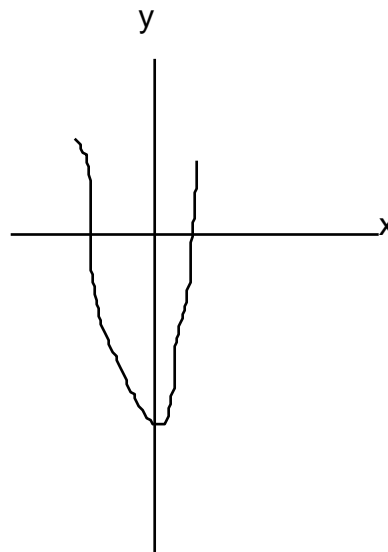
Please read ALGEBRAIC-GRAPHICAL CONNECTION and example 10 on page 846 before doing problems 15 - 20, find the x-intercept for the graph of each equation. (Please excuse me for my hand drawing the graphs. I just want you to see the graph intersects two points on x-axis. They are your answers. )

15.  $y = x^2 - x - 6$



Solution:

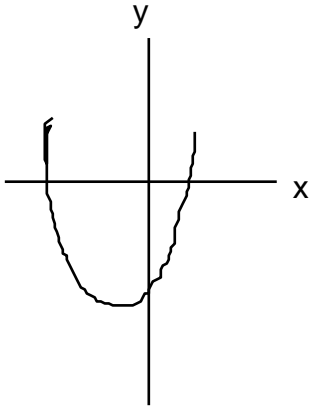
16.  $y = 2x^2 + x - 10$



Solution:

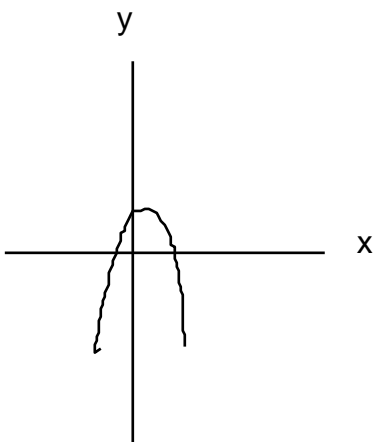
17.  $y = x^2 + 2x - 8$

18.  $y = x^2 + x - 6$

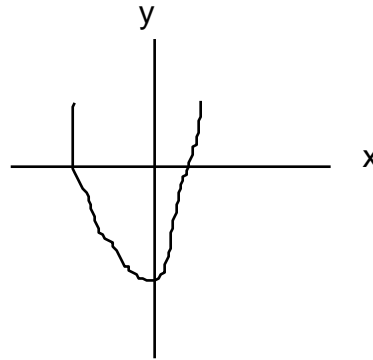


Solution:

19.  $y = -x^2 + 2x + 3$

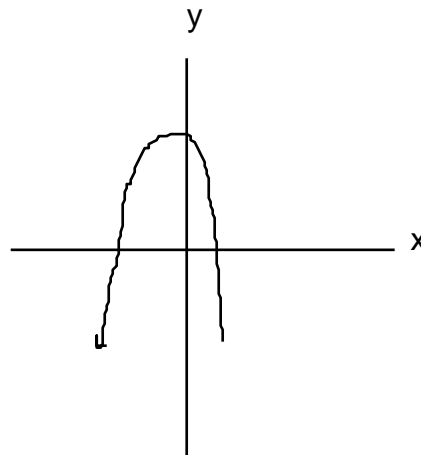


Solution:



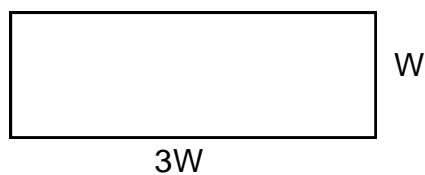
Solution:

20.  $y = -x^2 - x + 6$



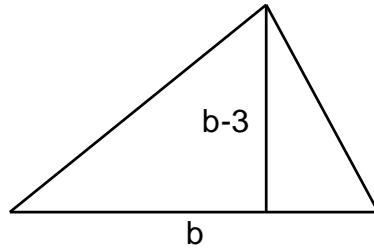
Solution:

21. A rectangular picture frame is three times as long as it is wide. The area of the frame is  $588 \text{ in}^2$ . Find the dimensions of the frame.



Solution:

22. The height of a triangle is 3 cm less than the length of the base. The area of the triangle is  $35 \text{ cm}^2$ . Find the height and the length of the base.



Solution:

23. A women's volleyball league has 23 teams. What is the total number of games to be played? If the number games,  $N = x^2 - x$ , where  $x$  is the number of teams.

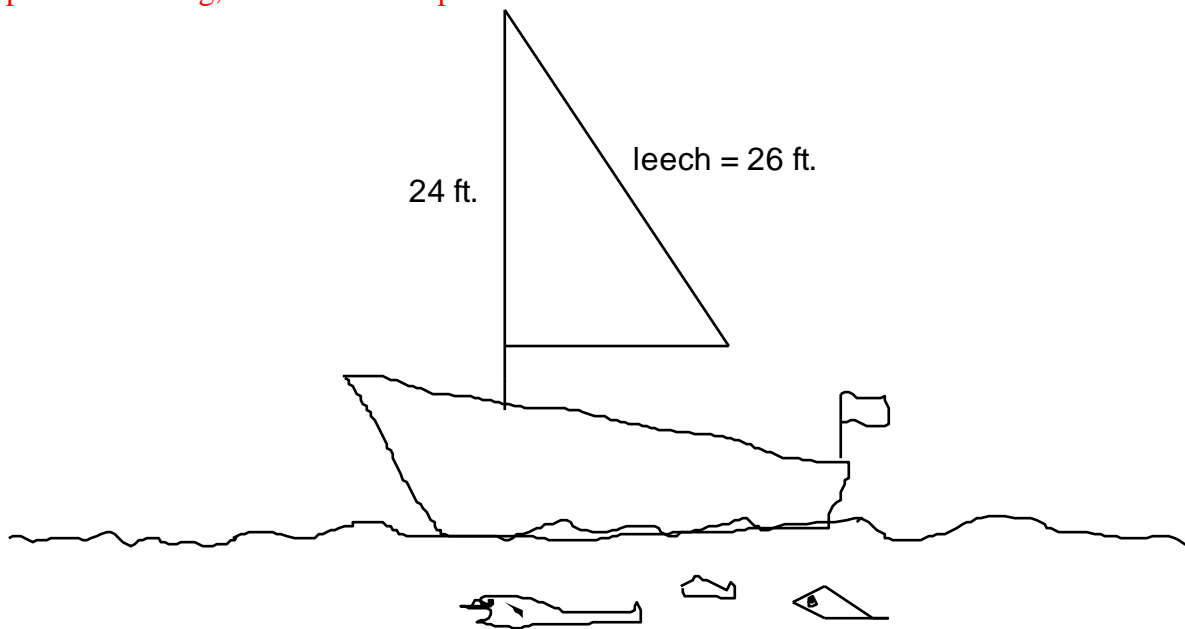
Solution:

24. A research wants to investigate the potential spread of germs by contact. She knows that the number of possible handshakes within a group of  $x$  people is given by

$N = \frac{1}{2}(x^2 - x)$ . There are 100 people at a party. How many handshakes are possible?

Solution:

25. The mainsail of a Lightning sailboat is a right triangle in which the hypotenuse is call the leech. If a 24-ft tall mainsail has a leech length of 26ft and the Dracon® sailcloth costs \$10 per square foot, find the cost of the new mainsail. **Please use five steps for problem solving, and show a complete solution.**



Solution:

Step 1. Familiarize the problem has been done above. You have to do steps 2, 3, 4, and 5.

Step 2: Set up the equation to solve for the base of the triangle

Step 3: find the base of the triangle.

Step 4, find the area of the triangle

Step 5, find the cost.