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Honors Math II
Unit 4 day 2: factoring/solving

Name Key
Period_____ Date_____

Factor completely the following expressions if possible. Remember to check for the GCF.

1. $6x^2 - 17x + 5$

$(2x-5)(3x-1)$

2. $4x^2 - 13x - 12$

$(4x+3)(x-4)$

3. $9x^3 - x$

$x(3x+1)(3x-1)$

4. $18x^2 + 36x + 16$

$2(3x+2)(3x+4)$

5. $22x^3 + 4x^2 - 18x$

$2x(11x-9)(x+1)$

6. $49m^2 - 16$

$(7m+4)(7m-4)$

7. $4y^3 - 5y^2 - 4y$

$y(4y^2-5y-4)$

8. $6x^2 - 24x$

$6x(x-4)$

9. $-4x^2 - 5x - 1$

$-(4x+1)(x+1)$

10. $7n^2 - 10n - 8$

$(7n+4)(n-2)$

11. $-6x^3 - 21x^2 + 27x$

$-3x(2x+9)(x-1)$

12. $20x^3 + 124x^2 + 24x$

$4x(5x+1)(x+6)$

13. $4m^2 + 12mn + 9n^2$

$(2m+3n)^2$

14. $-36x^2 + 48x - 15$

$-3(6x-5)(2x-1)$

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Solve the following equations.

15. $8m^4 - 4m^3 = 0$

$m = 0, 1/2$

16. $25n^2 - n = 0$

$n = 0, \frac{1}{25}$

17. $16x^2 - 1 = 0$

$x = \pm \frac{1}{4}$

18. $11x^2 - 44 = 0$

$x = \pm 2$

19. $14x^2 - 21x = 0$

$x = 0, 3/2$

20. $45x^2 + 10x = 0$

$x = 0, -2/9$

21. $9x^3 = 11x^2 + 14x$

$x = 0, -7/9, 2$

22. $9n^2 = 54n$

$n = 0, 6$

23. $4x^2 + 12x = -9$

$x = -3/2$

24. $-7x + 2 = 15x^2$

$x = -2/3, 1/5$

25. $6x^3 - 7x^2 - 5x = 0$

$x = 0, 5/3, -1/2$

26. $x = 4x^2 - 15x$

$x = 0, 4$

27. $2x^2 - 4x - 8 = -x^2 + x$

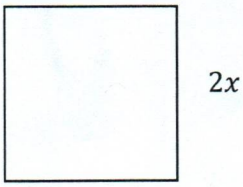
$x = 8/3, -1$

28. $24x^2 + 8x + 2 = 5 - 6x$

$x = 1/6, -3/4$

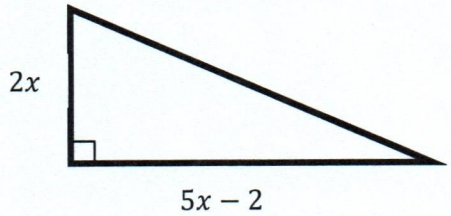
Find the value of x.

29. Area of square = 36



$x = 3$

30. Area of triangle = 115

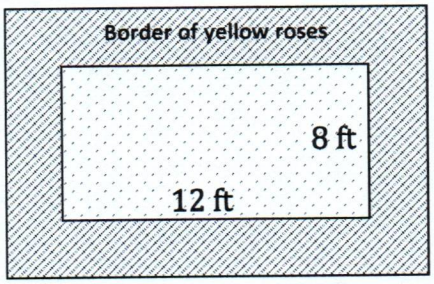


$x = 5$

31. You have a rectangular stained glass window that measures 2 feet by 1 foot. You have 4 square feet of glass with which to make a border of uniform width around the window. What should the width of the border be?

$x = \frac{1}{2}$ ft or 6 in

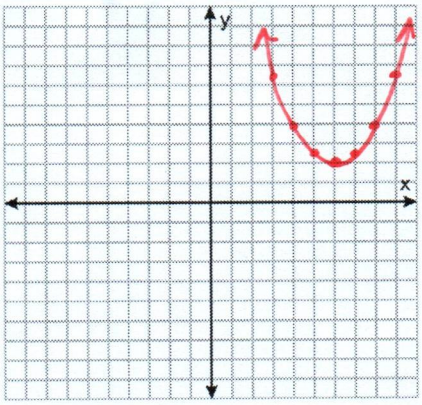
32. You have just planted a rectangular flower bed of red roses in a city park. You want to plant a border of yellow roses around the flower bed as shown. Because you bought the same number of red and yellow roses, the areas of the border and flower bed will be equal. What should the uniform width of the border of yellow roses be?



$x = 2$ ft

Graph the following parabolas; state the end behavior and the interval of increase and decrease.

33. $f(x) = \frac{1}{2}(x-6)^2 + 2$



V: (6,2)

decrease: $(-\infty, 6]$

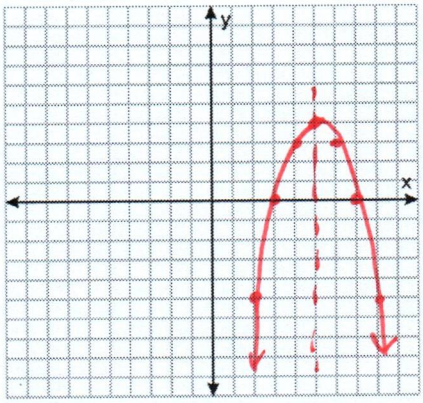
increase: $[6, \infty)$

$x \to -\infty \quad y \to \infty$

$x \to \infty \quad y \to \infty$

34. $f(x) = -(x-3)(x-7)$

(3,0) (7,0)



V: (5,4)

increase: $(-\infty, 5]$

decrease: $[5, \infty)$

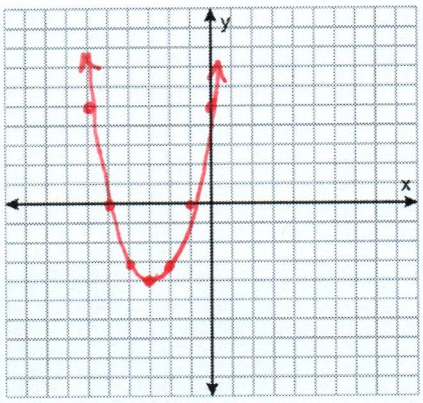
$x \to -\infty \quad f(x) \to -\infty$

$x \to \infty \quad f(x) \to -\infty$

35. $f(x) = x^2 + 6x + 5$

$x = \frac{-6}{2(1)} = -3$

V: (-3,-4)



decrease: $(-\infty, -3]$

increase: $[-3, \infty)$

$x \to -\infty \quad y \to \infty$

$x \to \infty \quad y \to \infty$