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Practice

## Algebra 2/Trig H

### Collection of problems as practice for the final

(Practice)

Remember:

1. The final-test has only 30 questions. Some with multiple parts.
2. You should **SHOW YOUR WORK** for all parts of the answer to receive full credit.
3. Clearly indicate (underline/ box/highlight) your final answer. Only **ONE** answer per question will be considered.

The use of calculator is NOT allowed.

Good luck!!  
Dr. Baharav

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<p>1. Simplify: <math>(2x - 3) \cdot (4x^2 + 6x + 9) - (4x^2 - 3)</math></p>	<p>2. Simplify: <math>(2x - 3) \cdot (2x + 3) - (x + 4)(2x - 8)</math></p>
<p>3. Factor completely: <math>8x^3 + 27</math></p>	<p>4. Factor completely: <math>x^2 - 8x + 15</math></p>
<p>5. Factor completely: <math>18x^3 - 8x</math></p>	<p>6. Factor completely: <math>6x^2 - 19x + 15</math></p>
<p>7. Simplify and give restricted values: <math>\frac{x^2 - 4}{x - 3} \cdot \frac{x^2 - 9}{x^2 + 5x + 6}</math></p>	<p>1. Simplify : <math>\frac{(x^3 - y^3)}{2} \div \frac{2x^3y - 2xy^3}{x + y}</math></p>

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8. Simplify and give restricted values:

$$\frac{1}{x-4} - \frac{x-1}{x+4} - \frac{6x-16}{x^2-16}$$

9. Simplify:

$$\frac{1}{x-4} - \frac{x-1}{x^2-x-12}$$

10. Solve:

$$\frac{2}{x^2-9} - \frac{2}{x+3} = \frac{x-4}{x-3}$$

11. Solve:

$$\frac{2}{x^2-3x-4} = \frac{1}{x^2-5x+4}$$

12. Solve:

$$\frac{7}{5x-1} = \frac{1}{(x+1)}$$

13. Divide using synthetic division:

$$(x^5 + 5x^4 - x^3 - 3x^2 + 5x - 25) \div (x + 5)$$

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14. Divide

$$\frac{30x^8 - 15x^6 + 40x^4}{5x^4}$$

15. Divide:

$$\frac{\left(\frac{1}{x-4} - \frac{1}{x+4}\right)}{\left(\frac{1}{x-4} + \frac{1}{x+4}\right)}$$

16. Divide using synthetic division:

$$(x^5 - 32) \div (x - 2)$$

17. Divide :

$$(64y^3 - 8) \div (4y - 2)$$

18. Simplify:

$$\sqrt[4]{\frac{64x^5y^7}{36xy^2}}$$

19. Complete the three missing boxes

$$\sqrt[3]{\frac{81x^8y^{-3}}{z^2}} = \frac{3 \cdot \square}{\square \cdot z} \cdot \sqrt[3]{\square x^2 z}$$

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20. Simplify:

$$2\sqrt{32} - \sqrt{50} + \sqrt{162}$$

21. Simplify :

$$\sqrt[3]{24} - \sqrt[3]{81}$$

22. Simplify (rationalize denominator)

$$\frac{\sqrt{3} + 5}{7 + \sqrt{3}}$$

23. Simplify (rationalize denominator)

$$\frac{4 - 2i}{4 + 2i}$$

24. Simplify

$$(\sqrt{-9} + \sqrt{9}) \cdot (\sqrt{4} + \sqrt{-4})$$

25. Simplify

$$2i \cdot (\sqrt{-9} + \sqrt{9}) + i \cdot (\sqrt{4} + \sqrt{-4})$$

26. Solve and check

$$x - 5 = \sqrt{x + 7}$$

27. Solve and check

$$\sqrt{x + 7} + 8 = x + 3$$

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28. Solve:

$$x^2 - 81 = 0$$

29. Solve :

$$x^2 - 81x = 0$$

30. Solve

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

31. Solve

$$\frac{1}{2}y^2 - 3y + 9 = 0$$

32. Solve

$$x^2 - 4x + 1 = 0$$

33. Solve

$$x^2 + 81 = 0$$

34. Find three consecutive integers such that the square of the first plus the product of the other two is 46.

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Graph the following functions. Indicate (if relevant) x-intercepts, y-intercepts, vertex, and any other significant points.

35.

$$f(x) = 2 \cdot (1 - x) \cdot (x - 3)$$

36.

$$f(x) = 4x - x^2$$

37.

$$f(x) = x^2 - 4x + 5$$

38.

$$f(x) = -(x - 1)^2 + 2$$

39.

$$f(x) = x^2 - 4x + 4$$

40.

$$f(x) = 7 - x$$

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**41.** Graph the following function

$$f(x) = x^6 + 3x^5 + 2x^4 - x^2 - 3x - 2$$

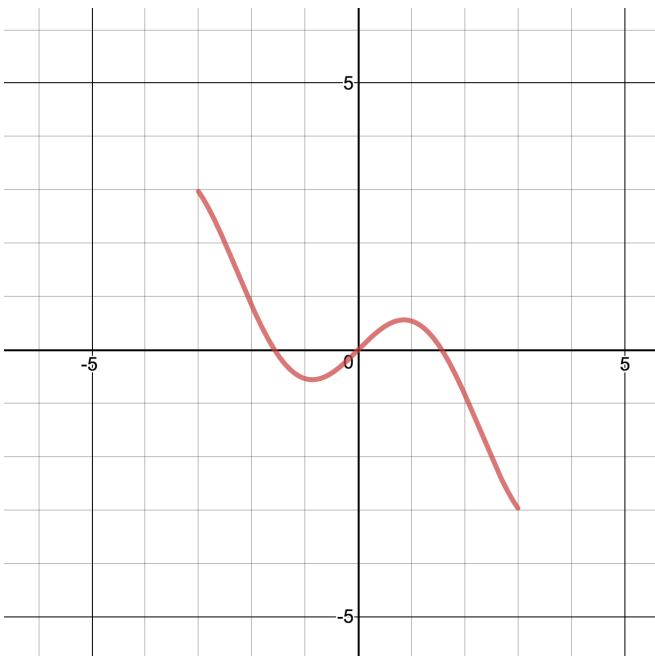
Hint: The function has roots at -2, 1, -1, and i.



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42. The sum of two even numbers is 16. Find the numbers such that their product is maximum.

43. Given the function  $f(x)$ :



Find Range and Domain: \_\_\_\_\_

Is the function Even/Odd? \_\_\_\_\_

Graph  $f(x + 2)$ . Range and Domain: \_\_\_\_\_

Graph  $f\left(\frac{x}{2}\right)$ . Range and Domain: \_\_\_\_\_

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<p><b>44.</b> Solve for x:</p> <p>a. <math>x = \log_2 64</math></p> <p>b. <math>2 = \log_7 x</math></p> <p>c. <math>2^{x+2} = 32</math></p>	<p><b>45.</b> Solve for x:</p> <p>a. <math>x^2 = \log_2 16</math></p> <p>b. <math>2 = \log_7 x^2</math></p> <p>c. <math>2^{(x^2)} = 64</math></p>
<p><b>46.</b> Calculate the following.</p> <p>a. <math>\log 4 + \log 250</math></p> <p>b. <math>\log_2 3 - \log_2 48</math></p> <p>c. <math>\log(10000) - \frac{\log_4 27}{\log_4 3}</math></p>	<p><b>47.</b> Give the value of the following functions.</p> <p>a. <math>\cos(30^\circ)</math></p> <p>b. <math>\sin(30^\circ)</math></p> <p>c. <math>\tan(30^\circ)</math></p>
<p><b>48.</b> Determine if each of the below is geometric, arithmetic, or neither</p> <p>a. 1,4,9,16,25,36, ...</p> <p>b. <math>\frac{1}{2}, \frac{3}{5}, \frac{5}{8}, \frac{8}{11} \dots</math></p> <p>c. <math>\frac{1}{2}, \frac{3}{2}, \frac{5}{2}, \frac{7}{2} \dots</math></p>	<p><b>49.</b> Calculate the sum:</p> $\sum_{n=0}^{101} (n - 50) = ?$

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<p>50. Given the functions</p> $f(x) = 2x^2 - 1 \quad \text{and}$ $g(x) = x^2 - 3$ <p>a. Find <math>f(g(x))</math></p> <p>b. Find <math>g(f(x))</math></p> <p>c. Find <math>g(x) + f(x)</math></p>	<p>51. Find the inverse of <math>f(x)</math> using Table and algebraic method, and plot both:</p> $f(x) = 1 - \sqrt{x - 2}$ <p>Remember to indicate range and domain of each function.</p>
<p>52. Find the equation of the line perpendicular to the line</p> $y = 5 - 2x$ <p>and that includes through the point (1,0). What is the intersection point of these two lines.</p>	<p><b>Word problems: See set II</b></p>

=== End of practice questions (There IS part II: Word problems and miscellaneous ).