Algebra 2 (Last Packet)

Day	Date	Video	Assignment Due	Is it done?
Monday	5/18/2020	11.2	467: 1-14 (sheet to replace 3c/3d/4c/4d)	
Tuesday	5/19/2020	11.3	473: 1-34, skip 3's	
Wednesday	5/20/2020	11.4	479: 1-43, skip 3's	
Thursday	5/21/2020		485: 1-24 even	
Friday	5/22/2020	PT	practice test chapter 11	
Monday	5/25/2020	NO SCHOOL		
Tuesday	5/26/2020		Chapter 11 Test	
Wednesday	5/27/2020	PF	Practice Final - Chapters 1-4 (1st half to 28)	
Thursday	5/28/2020	PF	Practice Final - Chapters 1-4 (2nd half to 55)	
Friday	5/29/2020		Take Final Exam Part 1	
Monday	6/1/2020	PF	Practice Final - Chapters 5-8	
Tuesday	6/2/2020		Take Final Exam Part 2	
Wednesday	6/3/2020	PF	Practice Final - Chapters 9-11	
Thursday	6/4/2020		Take Final Exam Part 3	
Friday	6/5/2020	nothing - there would have been no math this day		
How many total did you do:				

Zoom session happen Mon/Wed/Fri at 2:30 for those needing any help

473: ~~⊘⊓⊘⊘⊘⊘⊘⊘⊘~~ 1-34, skip x 3, ~~14,15,16,17,22,21~~

Polynomial of degree n can be factored
into n factors

$$P(x) = 3x^4 - 15x^3 + 18x^2 + 12x - 24$$
$$= 3(x-2)^3 (x+1)$$

ROOTS: 2 of multiplicity 3
       -1 of multiplicity 1

FIND A POLYNOMIAL OF DEGREE 3 WITH
-1, 2, AND 5 AS ROOTS

START
FACTORS WITH
x, SWITCH
ALL SIGNS
of NUMBERS

$$(x+1)(x-2)(x-5) = x^3 - 6x^2 + 3x + 10$$

FOIL

IF A COMPLEX NUMBER IS A ROOT, SO
IS ITS CONJUGATE (SWITCH SIGN of i)

$$2+3i \longrightarrow 2-3i$$
$$5i \longrightarrow -5i$$
$$2+\sqrt{3}i \longrightarrow 2-\sqrt{3}i$$

"BUY ONE,
GET ONE FREE"

IF $a + c\sqrt{b}$ IS A ROOT, SO IS ~~x+c~~
ITS CONJUGATE
(SWITCH SIGN of ~~ROOT~~)

$$\sqrt{2} \longrightarrow -\sqrt{2}$$
$$2+\sqrt{3} \longrightarrow 2-\sqrt{3}$$

FIND A POLYNOMIAL OF LOWEST DEGREE
WITH $1-\sqrt{2}$ AND $1+2i$ AS ROOTS

$1+\sqrt{2}$, $1-2i$ ALSO ROOTS (BOGO)

NOW MAKE 4 FACTORS - START WITH x, SWITCH ALL SIGNS OF NUMBERS

$$(x-1+\sqrt{2})(x-1-\sqrt{2})(x-1-2i)(x-1+2i)$$
$$= x^4 - 4x^3 + 8x^2 - 8x - 5$$

FIND OTHER ROOTS OF $x^4 + x^3 - x^2 + x - 2$
GIVEN i IS A ROOT

$(-i)$ ALSO ROOT (BOGO)

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

$$\begin{array}{r} x^2 + x - 2 \\ x^2+1 \overline{\smash{\big)}\ x^4 + x^3 - x^2 + x - 2} \\ \underline{x^4 \qquad + x^2} \\ x^3 - 2x^2 + x - 2 \\ \underline{x^3 \qquad + x} \\ -2x^2 - 2 \\ \underline{-2x^2 - 2} \\ 0 \end{array}$$

OR

$$\begin{array}{r|rrrrr} i & 1 & 1 & -1 & 1 & -2 \\ & & i & -1 & -1-2i & 2 \\ \hline & 1 & 1+i & 1-2 & -2i & 0 \end{array}$$

$$\begin{array}{r|rrrr} -i & 1 & 1+i & 1-2 & -2i \\ & & -i & -1 & 2i \\ \hline & 1 & 1 & -2 & 0 \end{array}$$

$x^2 + x - 2$

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

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

$-2, 1$

DON'T $\times$ ALT ODD

479: 1-43, skip $\times$3

479: 1-43   skip x3   Don't x out odd

$P(x) = 3x^4 - 11x^3 + 10x - 4$ LIST FACTORS of LAST #

LIST FACTORS of 1ST #   1,3   1,2,4

POSSIBLE ROOTS: $\pm\left(1, 2, 4, \frac{1}{2}, \frac{2}{3}, \frac{4}{3}\right)$ MAKE FRACTIONS BY DOING ALL COMBOS of # FROM LAST LIST ON TOP of # FROM 1ST LIST

$P(x) = 2x^4 - 7x^3 - 35x^2 + 13x + 3$

1,2   1,3

POSSIBLE ROOTS: $\pm\left(1, 3, \frac{1}{2}, \frac{3}{2}\right)$

TO TRY

$P(x) = x^3 + 6x^2 + x + 6$ FIND THE ROOTS

POSSIBILITIES: $\pm(1, 2, 3, 6)$

CHECK ONLY NEGATIVES IF PROBLEM HAS ALL POSITIVES

```
-6 | 1    6    1    6
   |     -6    0   -6
   ---------------------
     1    0    1 |  0
```

$x^2 + 1 = 0$

$x^2 = -1$

$x = \sqrt{-1}$

$i, -i$

$\boxed{-6, i, -i}$

FACT: VARIATION OF SIGNS GIVES MAX # of POSSIBLE POSITIVES IF IT'S 5, YOU'D HAVE 5,3,or 1 4,2,or 0

FACT: IF YA SYNTHETIC DIVIDE + GOT ALL POS ON ANSWER, IT'S AN UPPER BOUND

~~$x^3 \quad x^3 \quad 2x^2 \quad -x - 8$~~
~~$= (1, 2, 4, 8)$~~

~~NO RATIONAL ROOTS~~

$x^4 + x^2 + 2x - 16$

$\pm (1, 2, 3...)$ check neg only

$$
\begin{array}{r|rrrrr}
-1 & 1 & 0 & 1 & 2 & -16 \\
   &   & -1 & 1 & -2 & 0 \\
\hline
   & 1 & -1 & 2 & 0 & \,|\,-16 \\
\end{array}
$$

$$
\begin{array}{r|rrrrr}
-2 & 1 & 0 & 1 & 2 & -16 \\
   &   & -2 & 4 & -10 & 16 \\
\hline
   & 1 & -2 & 5 & -8 & \,|\,22 \\
\end{array}
$$

$$
\begin{array}{r|rrrrr}
-3 & 1 & 0 & 1 & 2 & -16 \\
   &   & -3 & 9 & -30 & 84 \\
\hline
   & 1 & -3 & 10 & -28 & \,|\,92 \\
\end{array}
$$

$$
\begin{array}{r|rrrrr}
-6 & 1 & 0 & 1 & 2 & -16 \\
   &   & -6 & 36 & -222 & 1320 \\
\hline
   & 1 & -6 & 37 & -220 & \,|\,1326 \\
\end{array}
$$

NO RATIONAL ROOTS   SINCE NONE OF THE POSSIBLES WORKED.

$2x^4 - 7x^3 - 35x^2 + 13x + 3$

$\pm(1, 3, \frac{1}{2}, \frac{3}{2})$ LIST POSSIBLES

$3\rfloor$

2	-7	-35	13	3
	6	-3		
2	-1	-38		1

$-3\rfloor$

2	-7	-35	13	3
	-6	39	-12	-3
2	-13	4	1	0

$\boxed{-3}$

$2x^3 - 13x^2 + 4x + 1$ MAKE A NEW LIST of POSSIBLES

$\pm(1, \frac{1}{2})$

$\frac{1}{2}\rfloor$

2	-13	4	1
	1	-6	-1
2	-12	-2	0

$\boxed{\frac{1}{2}}$

$\underbrace{2}_{a}x^2 \underbrace{-12}_{b}x \underbrace{-2}_{c}$ ONCE x^2, FACTOR OR QUADRATIC

$\frac{12 \pm \sqrt{144 + 16}}{4}$ $\frac{12 \pm \sqrt{160}}{4}$ $\frac{12 \pm 4\sqrt{10}}{4}$ $\boxed{3 \pm \sqrt{10}}$

485: 1-24 even

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

Name _____

Is the number a root? (5)

1. 1, of $x^3 + 6x^2 - x - 30$

     _____

2. 2, of $x^3 + 6x^2 - x - 30$

     _____

3. 3, of $x^3 + 6x^2 - x - 30$

     _____

4. -1, of $x^3 + 6x^2 - x - 30$

     _____

5. $1 + i$, of $x^3 - 2x^2 + 2x$

     _____

Is the polynomial a factor? (5)

6. $x - 1$, of $x^3 + 6x^2 - x - 30$

     _____

7. $x - 2$, of $x^3 + 6x^2 - x - 30$

     _____

8. $x - 3$, of $x^3 + 6x^2 - x - 30$

     _____

9. $x + 1$, of $x^3 + 6x^2 - x - 30$

     _____

10. $x + 2$, of $x^3 + 6x^2 - x - 30$

     _____

Divide. Find the quotient and the remainder. (5)

11. x - 2 into $x^3 + 5x^2 - 2x - 1$

_____

12. x + 2 into $x^3 + 4x^2 - 4$

_____

13. x - 3 into $x^3 + 3x^2 - 4x - 18$

_____

14. x + 2 into $x^3 + 2x^2 - 5x - 12$

_____

15. x - 4 into $x^3 + 6x - 10$

_____

Use synthetic division to find the function values of $P(x) = x^3 + 6x^2 - 5x + 4$. (3)

16. P(3)

_____

17. P(6)

_____

18. P(-2)

_____

Factor the polynomial to solve the equation P(x) = 0. (5)

19. $x^3 + 4x^2 + x - 6$

_____

20. $x^3 - 6x^2 + 3x + 10$

_____

21. $x^3 - x^2 - 14x + 24$ _____

22. $x^3 + 2x^2 - 5x - 6$ _____

23. $x^4 - x^3 - 19x^2 + 49x - 30$ _____

Find the roots of each polynomial and state the multiplicity of each. (2)

24. $(x+4)^2 (x-5)^3$

_____

25. $x^2 (x-1) (x+6)^3$

_____

Find a polynomial of degree 3 with the given roots. Do not multiply out. (2)

26. 2, -3, 4

_____

27. 2, i, -i

_____

Suppose a polynomial of degree 6 with rational coefficients has the given roots. Find the other roots. (2)

28. 2, 3, 4i, 2 - 5i

_____

29. 5, 6, $\sqrt{3}$, $3 - \sqrt{2}$

_____

Find a polynomial of lowest degree that has the given numbers as some of its roots. Do not multiply out. (2)

30. 2, -3i, $1 - \sqrt{5}$

_____

31. 5, $3 + \sqrt{7}$, $2 + 2i$

_____

Given that the polynomial has the given root, find the other roots. (5)

32. $x^4 - 5x^3 + 7x^2 - 5x + 6$; i is a root

_____

33. $x^4 - 16$; $2i$ is a root   _____

34. $x^3 + 8$; -2 is a root   _____

35. $x^3 - 4x^2 + x - 4$; $-i$ is a root   _____

36. $x^3 - x^2 - 7x + 15$; -3 is a root   _____

List all of the possible rational roots. (2)

37. $2x^4 - 5x^3 + 7x^2 - 5x + 3$ _____

38. $4x^4 - 5x^3 + 7x^2 - 5x + 5$ _____

Find the rational roots, if they exist, of each polynomial. If possible, find the other roots. (3)

39. $x^3 + 3x^2 - 2x - 6$ _____

40. $x^3 - x^2 - 3x + 3$ _____

41. $x^3 + 3x^2 - x - 3$ _____

Find only the rational roots. (3)

42. $x^4 + 16$ _____

43. $x^5 - 5x^4 + 5x^3 + 15x^2 - 36x + 20$ _____

44. $x^3 - x^2 - 4x + 3$ _____

Name _____

Is the number a root?

1. 1, of $x^3 - 5x^2 - x + 5$

                 _____

2. 2, of $x^3 - 5x^2 - x + 5$

                 _____

3. 3, of $x^3 - 5x^2 - x + 5$

                 _____

4. -1, of $x^3 - 5x^2 - x + 5$

                 _____

5. 1 - i, of $x^3 - 2x^2 + 2x$

                 _____

Is the polynomial a factor?

6. x - 1, of $x^3 - 5x^2 - x + 5$

                 _____

7. x + 4, of $x^3 - 5x^2 - x + 5$

                 _____

8. x - 5, of $x^3 - 5x^2 + 9x - 5$

                 _____

9. x + 1, of $x^3 - 5x^2 - x + 5$

                 _____

10. x - 4, of $x^3 - 5x^2 - x + 5$

                 _____

Divide. Find the quotient and the remainder.

11. x - 3 into $x^3 + 7x^2 - 6x - 5$

                 _____

12. x - 4 into $2x^3 + 3x^2 - 4$

                 _____

13. $x + 5$ into $x^3 + 5x^2 - 6x + 7$

_____

14. $x + 2$ into $x^3 + 4x^2 - 5x - 6$

_____

15. $x + 1$ into $2x^3 + 6x - 10$

_____

Use synthetic division to find the function values of $P(x) = x^3 + 3x^2 - 4x + 5$.

16. $P(2)$

_____

17. $P(3)$

_____

18. $P(-2)$

_____

Factor the polynomial to solve the equation $P(x) = 0$. (2 points each)

19. $x^3 + 2x^2 - 5x - 6$

_____

20. $x^3 - 6x^2 + 4x + 8$

_____

21. $x^4 + 11x^3 + 41x^2 + 61x + 30$

_____

Find the roots of each polynomial and state the multiplicity of each.

22. $(x + 7)^5 (x - 4)^2$

_____

23. $x^3 (x - 2) (x + 5)^4$

_____

Find a polynomial of degree 3 with the given roots. Do not multiply out.

24. 2, -3, 4

_____

25. 3, 5i, -5i

_____

Suppose a polynomial of degree 6 with rational coefficients has the given roots. Find the other roots.

26. 1, -4, i, $2 - \sqrt{5}$

_____

27. -1, 2, -2i, $3 - \sqrt{7}$

_____

Find a polynomial of lowest degree that has the given numbers as some of its roots. Do not multiply out.

28. 2, -2i, $1 - \sqrt{3}$

_____

29. -1, $3 + \sqrt{2}$, $2 + 4i$

_____

Given that the polynomial has the given root, find the other roots. (2 points each)

30. $x^4 + x^3 - x^2 + x - 2$; -i is a root

_____

31. $x^4 - 16$; 2i is a root

_____

32. $x^3 - 27$; 3 is a root

_____

List all of the possible rational roots.

33. $5x^4 - 5x^3 + 7x^2 - 5x + 2$

34. $6x^4 - 5x^3 + 7x^2 - 5x + 4$

Find the rational roots, if they exist, of each polynomial. If possible, find the other roots. (2 points each)

35. $x^3 - x^2 - 4x + 4$

36. $x^3 + 3x^2 - 5x - 10$

37. $x^4 - 3x^3 - 20x^2 - 24x - 8$

Find only the rational roots. (2 points each)

38. $x^5 - 3x^4 - 3x^3 + 9x^2 - 4x + 12$

39. $x^3 - x^2 - 4x + 3$

Chapter 1

1. Evaluate the expression $6x + 5y - 4z$ when $x = 7$, $y = 11$, and $z = 9$.   _____

2. What is $|15 - 22 + 6|$ _____

3. $-16 + (-24) =$ (calculator not allowed)   _____

4. $-22 - 7 =$ (calculator not allowed)   _____

5. $\dfrac{2}{7} \cdot (-\dfrac{6}{11}) =$ (calculator not allowed)   _____

6. $-28 \div 4 =$ (calculator not allowed)   _____

Multiply or divide and simplify.

7. $x^4 \cdot x^{-3}$ _____

8. $\dfrac{18x^7 y^{-2}}{9x^{-5} y^4}$ _____

Simplify.

9. $(x^5)^5$ _____

Convert to scientific notation.

10. 765 000 000 000   _____

Convert to decimal notation.

11. 5.234×10^{-5} _____

Multiply or divide in scientific notation

12. $\dfrac{8 \times 10^6}{4 \times 10^4}$ _____

13. $(3 \times 10^{-8})(6 \times 10^{-7})$ _____

Chapter 2

Solve.

14. x -4 = 17   _____

15. 6x - 2 = 46   _____

16. $\dfrac{1}{4}x + \dfrac{3}{8} = \dfrac{5}{8}$ _____

Write an equation and then solve the problem.

17. Find three consecutive odd integers such that the sum of the two times the first, three times the second, and four times the third is 103.

_____

_____

Solve the formula.

18. A = lw, for w   _____

19. $A = \dfrac{1}{2}h(a+b)$, for a   _____

Graph the inequality.

20. $x \le 7$ _____

Solve the inequality.

21. x + 4 < 7   _____

22. 2x - 5 > 6x - 11   _____

Set up an equation for the word problem and then solve it.

23. On three tests, you score 92, 85, and 88. To get an A, you need a total of 360 points on four tests. What scores on the last test will give you an A?

_____

_____

Graph the compound inequality.

24. $-2 < x \leq 3$

_____

Solve the compound inequality.

25. $3 < 5x + 8 < 23$

_____

Solve.

26. $|x| = 6$

_____

27. $|x + 5| > 6$

_____

28. $|2x + 3| < 7$

_____

Chapter 3

Put all equations of lines in slope-intercept form.

29. Plot the following points on graph paper: {(2, 1), (-2, 1), (-2, -1), (2, -1)}.

30. Is (2,3) a solution of $y = 4x - 5$? _____

31. Graph the equation $y = 2x - 2$ on graph paper.

32. Is this a function? _____

33. $f(x) = 3x - 4$. What are $f(-1)$, $f(0)$, and $f(1)$?   ____ ____ ____

34. What are the intercepts of the equation $2x + 8 = 4y$? _____

35. Find the slope of the line containing the points (8,1) and (-2,-4). _____

36. What is the slope of the line $x = 2$? _____

37. What is the slope of the line $y = -1$? _____

38. Find the equation of the line through (2,3) with slope 3. _____

39. Find the equation of a line through (4,5) and (5,9). _____

40. Find the slope and y-intercept of the line $y = -3x + 7$ _____ _____

41. Write an equation of a line with slope 5 and y-intercept (0,-8) _____

42. Are the lines $y = -3x + 5$ and $y = -3x + 5$ parallel? _____

43. Write an equation of a line parallel to $4x + y = 12$ through (3,2) _____

44. Are the lines $3x + 7y = 9$ and $7x - 3y = 6$ perpendicular? _____

45. Write an equation of a line perpendicular to $6x + 3y = 9$ through (2,5) _____

Chapter 4

Solve each system of equations graphically. Use graph paper and use each space as one unit.

46. $5x + 3y = 15$

        $4x + 2y = 12$ _____

Solve each system of equations using the substitution method.

47. $5x + 6y = -28$

        $x + 5y = -17$ _____

Solve each system of equations using the addition method.

48. $2x + 3y = -8$

        $3x - 4y = 5$ _____

49. One day, the office sold 100 pens and pencils, pens at 25 cents, and pencils at 15 cents. In all $20.00 was made. How many of each were sold.

system: _____

solution: _____

Solve the system of equations.

50. $2x + 3y + 4z = 11$

              $4y + 5z = 14$

                    $2z = 4$

_____

51. $x + y + z = 6$

          $x + y \quad = 4$

            $y + z = 4$

_____

Write a system of equations and solve the system.

52. On the Cheswick Charger basketball team there are three players who can score, Andy, Breyon, and Crey. When all three play, they score 50 points. When Andy and Breyon play, they score 40 points. When Breyon and Crey play, they score 30. How many points can be scored by each player individually?

System: _____

_____

_____

Solution: _____

Graph the inequalities on graph paper. Use each space as 1 unit.

53. $y < 2$

54. $y \geq 2x - 1$

55. $y < x$

           $y > -2x + 4$

29

31

45

53

54

55

Chapter 5

Add

1. $2x^2 - 3xy^2 - 4xy + 5y - 6$ and $-9x^2 - 8xy^2 + 7xy + 6y - 5$

_____

Subtract.

2. $(6x^2 + 7xy^2 - 8xy - 9y + 10) - (-8x^2 + 7xy^2 - 6xy + 5y - 4)$

_____

Multiply.

3. $(4x + 6y + 8)(3x + 5y + 7)$

_____

4. $(2x + 5)(4x + 7)$

_____

5. $(x + 1)^2$

_____

6. $(2x + 7)(2x - 7)$

_____

Factor.

7. $x^2 + 8x + 12$

_____

8. $x^2 - 36$

_____

9. $10xz - 20yz$

_____

10. $3x^2 + 17x + 10$

_____

11. $qx + qy - rx - ry$

_____

Factor completely.

12. $y^6 - 64$

_____

13. $y^4 - 16$

_____

Solve each problem by writing and solving an equation.

14. Four times the square of a number is twenty-one more than eight times the number. What is the number?

_____

_____

15. A flower bed is 5 meters longer than it is wide. The flower bed will have an area of 150 square meters. What are the length and width of the flower bed?

_____

_____

Chapter 6

Multiply and simplify.

16. $\dfrac{x^2 - 9}{x^2} \cdot \dfrac{x^2 - 4x}{x^2 + x - 12}$

_____

Divide and simplify.

17. $\dfrac{x^2 - 16}{x + 2} \div \dfrac{x - 4}{x + 2}$

_____

Find the LCM of

18. 9 and 18

_____

19. $4 x^4 y^3$ and $5 x^3 y^3$

_____

Add or subtract

20. $\dfrac{4 + x}{x} + \dfrac{2x}{x}$

_____

21. $\dfrac{x - 3}{x + 4} + \dfrac{x + 4}{x - 6}$

_____

Simplify.

22. $\dfrac{\dfrac{1}{x} + 5}{\dfrac{1}{x} - 4}$

_____

23. $\dfrac{\dfrac{y^2 - y - 6}{y^2 - 5y - 14}}{\dfrac{y^2 + 3y + 2}{y^2 - 6y - 7}}$

_____

Divide.

24. $\dfrac{20x^8 - 28x^6 + 32x^4}{4x^4}$

_____

Solve.

25. $\dfrac{1}{4} - \dfrac{5}{6} = \dfrac{1}{x}$

_____

26. $y + \dfrac{9}{y} = 10$

_____

Solve the problem.

27. Crey can complete a job in 8 hours. Emily can do the same job in 4 hours. How long will it take them to do the job working together?

_____

28. One car travels 10 km/h faster than another. One travels 480 km in the time that the other travels 400. How fast are the two cars going?

_____

Solve the formula for the given letter.

29. $\dfrac{W_1}{W_2} = \dfrac{d_1}{d_2}; W_2$

_____

30. $\dfrac{1}{p} + \dfrac{1}{q} = \dfrac{1}{f}; q$

_____

Chapter 7

31. What are the square roots of 16?

_____

Multiply and simplify.

32. $\sqrt{5}\sqrt{15}$

_____

Divide and simplify.

33. $\sqrt{\dfrac{49}{16}}$

_____

Add or subtract.

34. $7\sqrt{3} - 5\sqrt{3}$

_____

Multiply.

35. $(\sqrt{2} - 2\sqrt{5})(2\sqrt{2} + \sqrt{5})$

_____

Rewrite without fractional exponents.

36. $x^{\frac{5}{7}}$

_____

Rewrite with fractional exponents.

37. $\sqrt[7]{x^2}$

_____

Rewrite with positive exponents.

38. $x^{-\frac{3}{5}}$

_____

Use the properties of exponents to simplify.

39. $5^{\frac{1}{2}} \cdot 5^{\frac{2}{3}}$

_____

40. $(x^{\frac{2}{5}})^{\frac{5}{6}}$

_____

Write a single radical expression.

41. $\dfrac{\sqrt[5]{x^4}}{\sqrt{x}}$

_____

Solve the radical equation.

42. $\sqrt{x+3} = 8$

_____

43. $\sqrt{x-9} + \sqrt{x} = 9$

_____

Express in terms of i.

44. $\sqrt{-25}$

_____

Multiply.

45. $4i \cdot 9i$

_____

46. $(7 + 5i)(7 - 5i)$

_____

Find the conjugate.

47. $9 + 3i$

_____

Find the reciprocal.

48. $3 + 7i$

_____

Divide.

49. $\dfrac{3 + 4i}{5 - 6i}$

_____

Our favorite problem of the year: If z is a complex number, find a polynomial in $\bar{z}$ that is the conjugate.

50. $z^2 - 2z - 3$

_____

51. State the Quadratic Formula.

_____

Solve by any method you choose.

52. $x^2 + 5x + 6 = 0$

_____

53. $x^2 - 3x = 0$

_____

54. $x^2 + 9 = 0$

_____

55. $x^2 - 4x + 13 = 0$

_____

56. $x^2 - 3x - 6 = 0$

_____

57. $x^2 + 16x + 64 = 0$

_____

58. $x^2 - 36 = 0$

_____

Solve by substituting.

59. $x^4 - 10x^2 + 25 = 0$

_____

60. $x - 6\sqrt{x} - 16 = 0$

_____

Chapter 9

Is the figure symmetric to the given line and to the given point? Answer yes or no.

1.

_____ _____

Test for symmetry to the x-axis and the y-axis. Answer yes or no.

2. $3x^2 + 4y = 6$

_____ _____

Test for symmetry with respect to the origin. Answer yes or no.

3. $3x = 6y$

_____

Determine whether each function is even, odd, or neither.

4. $f(x) = x^4 + x^8$

_____

5. $f(x) = x^6 + x^3$

_____

Tell how the graph of f(x) would be transformed.

6. $1 + f(x)$

_____

7. $3 f(x)$

_____

8. $f(4x)$

_____

9. $-5 f(x - 4)$

_____

Graph on graph paper.

10. $y = |x - 5|$

11. $y = 6 + \dfrac{1}{3}|x|$

12. $y = 2x^2$

13. $y = -(x - 3)^2$

14. $f(\dfrac{1}{2}x)^2$

Find the vertex, line of symmetry, and the max or min.

15. $f(x) = (x+2)^2 + 4$

     _____   _____   _____

Complete the squareto get an equation in the form f (x) = a (x - h) ^{2} + k.

16. $f(x) = x^2 + 3x + 2$

     _____

Find the x-intercepts.

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

     _____

18. $f(x) = x^2 + 2x + 3$

     _____

Chapter 10

Find the distance between the points.

19. (3,2) and (0,2)

     _____

Find the midpoint of the segments having the following endpoints.

20. (4,5) and (-6,-7)

     _____

Find the center and the radius of the circle.

21. $x^2 + y^2 = 7$

     _____   _____

22. $x^2 + y^2 + 6x - 4y - 15 = 0$

     _____   _____

Write an equation for a circle with.

23. center (-2,3) and radius $\sqrt{6}$

_____

Find the center, vertices, and foci.

24. $\dfrac{x^2}{9} + \dfrac{y^2}{16} = 1$

center: _____

vertices: _____ _____ _____ _____

foci: _____ _____

Put the equation for each ellipse in standard form.

25. $4x^2 + 9y^2 - 16x + 18y - 11 = 0$

_____

Graph an ellipse with

26. center (4,1)

vertices (6,1), (2,1), (4,2), and (4,0)

foci $(4+\sqrt{3},1)$ and $(4-\sqrt{3},1)$

GRAPH
#24

Find the center, vertices, foci, and asymptotes.

27. $9y^2 - 4x^2 = 36$

center: _____

vertices: _____ _____

foci: _____ _____

asymptotes: _____ _____

Put the equation for each hyperbola in standard form.

28. $4x^2 - y^2 + 24x + 4y + 28 = 0$

_____

Graph the hyperbola

29. number 10 27

Find the vertex, focus, and directrix of the parabola.

30. $(y-5)^2 = -12(x+7)$

vertex: _____

focus: _____

directrix: _____

Put the equation of a parabola in standard form.

31. $x^2 + 6x + 4y + 5 = 0$ _____

Write an equation of a parabola satisfying the given conditions.

32. Focus (0,4) directrix y = -4   _____

Graph a parabola with

33.   vertex (0,0)   focus (0,1)   directrix y = -1

34.   vertex (-4,-3)   focus (-2,-3)   directrix x = -6

Solve using the substitution method, the addition method, or by graphing.

35. $y = x^2$
$3x = y + 2$ _____

36. $x^2 + y^2 = 32$
$x^2 - y^2 = 0$ _____

37. $\begin{array}{l} x^2 + y^2 = 17 \\ xy = 4 \end{array}$

_____

Chapter 11

Is the number a root?

38. 1, of $x^3 - 6x^2 + 11x - 6$

_____

Is the polynomial a factor?

39. $x - 1$, of $x^3 - 6x^2 + 11x - 6$

_____

40. $x + 2$, of $x^3 + 6x^2 + 11x + 6$

_____

Divide. Find the quotient and the remainder.

41. $x - 2$ into $x^3 + 7x^2 - 6x - 5$

_____

42. $x - 3$ into $2x^3 + 3x^2 - 4$

_____

Use synthetic division to find the function values of $P(x) = x^3 + 2x^2 - 3x + 4$.

43. $P(2)$

_____

Factor the polynomial to solve the equation P(x) = 0.

44. $x^3 + 2x^2 - 13x + 10$　　　　　　　　　　　　＿＿＿＿＿＿＿＿

45. $x^4 + 11x^3 + 41x^2 + 61x + 30$　　　　　　　＿＿＿＿＿＿＿＿

Find the roots of each polynomial and state the multiplicity of each.

46. $(x + 2)^4 (x - 3)^2$　　　　　　　　　　　　＿＿＿＿＿＿＿＿＿＿＿

Find a polynomial of degree 3 with the given roots. Do not multiply out.

47. $3, 2i, -2i$　　　　　　　　　　　　　　＿＿＿＿＿＿＿＿＿＿＿

Suppose a polynomial of degree 6 with rational coefficients has the given roots. Find the other roots.

48. $1, -4, i, 2 - \sqrt{3}$　　　　　　　　　　＿＿＿＿＿＿＿＿＿＿＿

Find a polynomial of lowest degree that has the given numbers as some of its roots. Do not multiply out.

49. $2, -2i, 1-\sqrt{5}$

_____

Given that the polynomial has the given root, find the other roots.

50. $x^4 + x^3 - x^2 + x - 2$; i is a root

_____

51. $x^3 - 8$; 2 is a root

_____

List all of the possible rational roots.

52. $3x^4 - 5x^3 + 7x^2 - 5x + 2$

_____

Find the rational roots, if they exist, of each polynomial. If possible, find the other roots.

53. $x^3 - x^2 - 3x + 3$ _____

54. $x^4 - 3x^3 - 20x^2 - 24x - 8$ _____

Find only the rational roots.

55. $x^5 - 3x^4 - 3x^3 + 9x^2 - 4x + 12$ _____

(10)

(11)

(12)

(13)

(14)

(26)

(29)

(33)

(34)