CP Algebra II Final Exam Review 2018

5.3 Dividing Polynomials:

1. Simplify: $\dfrac{36x^2y^3 + 9xy - 45x^4y^6}{9xy}$

Use synthetic division to simplify:

2. $\left(x^4 + 9x^3 - x^2 + 80x - 100\right) \div \left(x + 10\right)$

3. $\left(b^4 + 6b^3 + 6b + 32\right) \div \left(b + 6\right)$

5.6 Radical Expressions:

Simplify:

4. $-3\sqrt{20} + 15\sqrt{45} - 6\sqrt{80} + 10\sqrt{500}$

5. $\left(6\sqrt{5}\right)^2$

6. $(3 - \sqrt{5})^2$

7. $3b\sqrt{24a^3b^8c}$

8. $(x + \sqrt{10})(x - \sqrt{10})$

9. $(-3\sqrt{6})(2\sqrt{3})$

Rationalize the denominator:

10. $\dfrac{5}{\sqrt{3}}$

11. $\dfrac{10}{\sqrt{5}}$

12. $\dfrac{\sqrt{6}}{\sqrt{3}}$

(5-9) Complex Numbers

Simplify:

13. $-2i \bullet 7i$

14. $\sqrt{-100}$

15. $\sqrt{-120}$

16. $-12i^2$

17. $(3 - 4i)(2 + 5i)$

18. $(2 - 7i)^2$

19. $(3-4i)+(-2-8i)$

20. $(6+3i)-(2-10i)$

21. i^{16}

22. i^{23}

Simplify

23. $\sqrt{-10} \bullet \sqrt{-15}$

24. $(6i)(2i)$

_____

25. Find the sum of the solutions of $\quad 3x^2 - 3x + 3 = 2x^2 - 7x + 15$

Solve:

26. $3x^2 + 48 = 0$

27. $4x^2 = -32$

(6-3) Solve by factoring:

28. $2x^2 + 7x = 15$

29. $x^2 = 6x$

30. $x^2 + 3x = 18$

31. $x^2 = 16x - 64$

(6-5) Quadratic Formula

Solve using the quadratic formula: $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

32. $x^2 - 11x + 24 = 0$

33. $14x^2 + 9x = -1$

Find a quadratic equation of the form $ax^2 + bx + c = 0$ with the given roots:

34. -7, 4

35. 0, 6

(6-4) Completing the Square

Find the value c that makes the trinomial a perfect square trinomial.

37. $x^2 - 14x + c$

38. $x^2 + 10x + c$

Solve by completing the square:

39. $x^2 - 8x + 15 = 0$

40. $x^2 + 2x - 120 = 0$

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

(6-6) Vertex Form

Write each quadratic function in vertex form by completing the square. Identify the vertex.

42. $y = x^2 - 12x + 23$

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

Vertex _____

Vertex _____

(6-1) Find the vertex, the y- intercept, the axis of symmetry and graph the quadratic equation. State whether the function has a maximum or minimum value and find that value.

45. $y = 3x^2 + 6x - 1$

46. $y = -x^2 - 6x + 3$
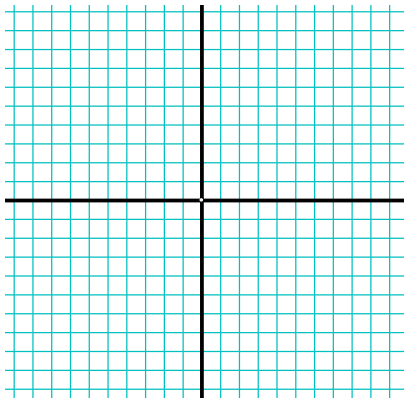
Axis of symmetry _____

Axis of symmetry _____

Vertex _____

Vertex _____

y- intercept _____

y- intercept _____

x-intercepts _____

x-intercepts _____

47.The distance a diver above the water $d(t)$ (in feet) t seconds after diving off a platform is modeled by the equation $d(t) = -16t^2 + 8t + 30$.

a. Find the time at which the diver will be at a maximum height.

b. Find the maximum height of the diver.

c. Find the time it will take the diver to hit the water.

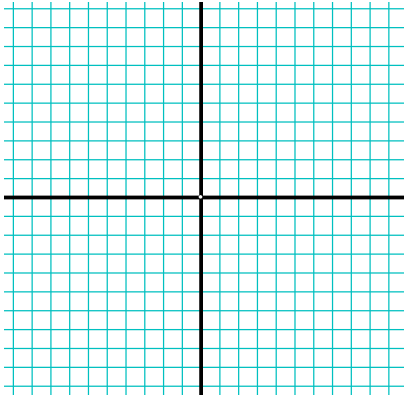**48.** A ball is shot into the air and its height can be modeled by the equation

$$h(t) = -16t^2 + 48t + 64$$, where $h(t)$ = height in feet and t = time in seconds.

    a) How long does it take for the ball to reach the ground?

    b) What is the maximum height the ball reaches?

(2-7) Graph the following inequalities.

49. $y \geq \dfrac{1}{2}x - 5$

50. $4x - 5y - 10 < 5$
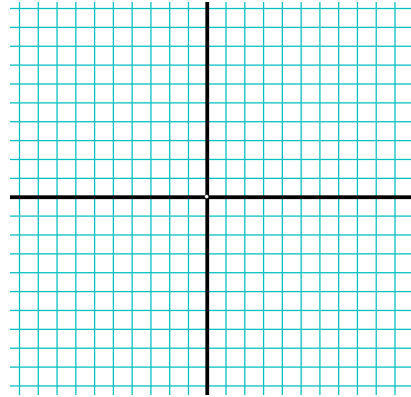
(3-3) Graph the following systems of equations on the coordinate plane.

51. $\begin{array}{l} y > -2x + 4 \\ y \leq x - 2 \end{array}$

52. $\begin{array}{l} 3x + 2y \geq 6 \\ 4x - y > 2 \end{array}$
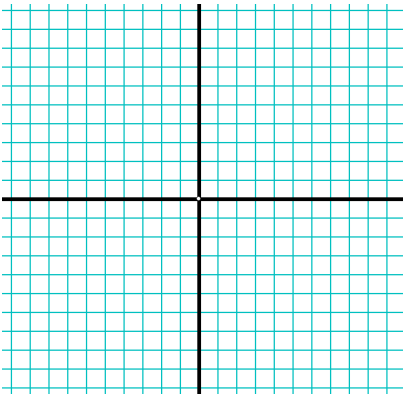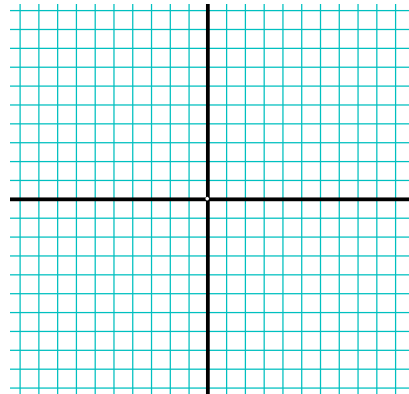
(5-8)Solve for the variable.

53. $7 + \sqrt{4x + 8} = 9$

54. $\sqrt{2t - 7} = \sqrt{t + 2}$

(9-1) Multiplying and Dividing Rational Expressions

Simplify:

55. $\dfrac{x+y}{x^2-y^2}$

56. $\dfrac{5x^2y^3}{3a^5b^4} \div \dfrac{23x^5y}{42a^7b^3}$

57. $\dfrac{x^2-3x-10}{2x^2+5x-3} \div \dfrac{x^2-2x-15}{2x^2-9x+4}$

58. $\dfrac{x^2-100}{x^2+7x-30} \bullet \dfrac{x^2-x-6}{x^2+9x+14}$

59. $\dfrac{x^2-x-20}{x^3y^2} \bullet \dfrac{x^2y^3}{x^2-16}$

(9-3) Graphing Rational Functions

60. Identify the x values of the asymptote and discontinuity $f(x) = \dfrac{x+2}{x^2 - x - 6}$.

61. Identify the x values of the asymptote and discontinuity $g(x) = \dfrac{x+5}{x^2 + 11x + 30}$.

Identify the equation of the vertical asymptote and the discontinuity. Graph.

62. $k(x) = \dfrac{x-5}{x^2 - 4x - 5}$

Simplified Function _____

Vertical asymptote _____
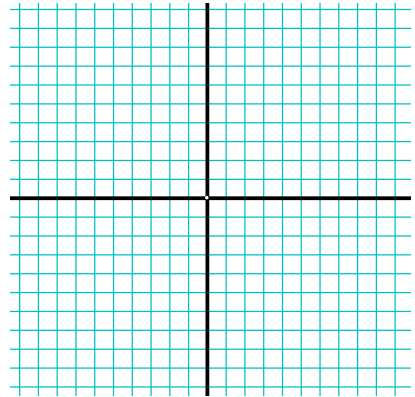
Discontinuity _____

63. $m(x) = \dfrac{x+1}{x^2 - 1}$

Simplified Function _____

Vertical asymptote _____

Discontinuity _____
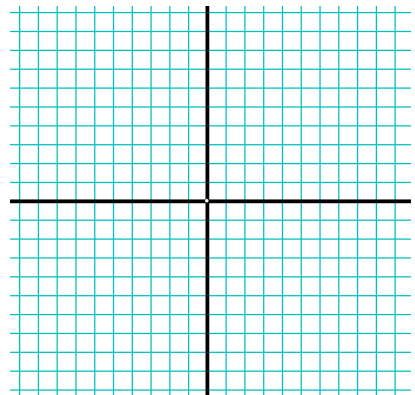
(13-1) Right Triangle Trigonometry

Write an equation involving the sin, cos and tan functions and solve for the missing side length. Round your answer to the nearest tenths place.
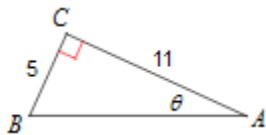
64.

65.

66.
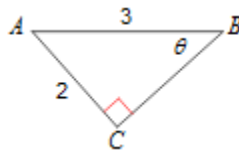

X = _____   X = _____   X = _____
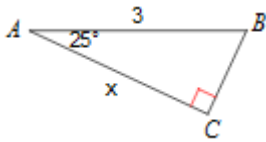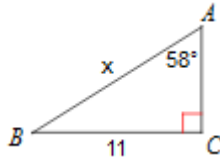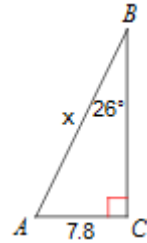
Write an equation involving the inverse trig functions to solve for the missing angle measure. Round your answer to the nearest whole degree.
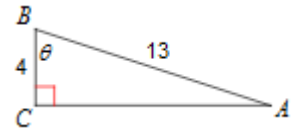
67.

68.

69.

θ = _____ θ = _____ θ = _____

Trig Applications with angle of elevation and depression:

70. A surveyor stands 100 feet from a building and sights the top of the building at a 55° angle of elevation. Find the <u>height of the building</u>.

71. Nicole is going ziplining in a cavern in Louisville, KY. She begins on a platform which is 120 feet high. The zipline is at an angle of elevation of 21° with the ground. To the nearest tenth, how long is the zipline?

72. Matt is looking up at the top of a flag pole which is 23 feet tall. He is 60 feet away from the base of the pole. To the nearest degree, at what angle of elevation is Matt looking up?
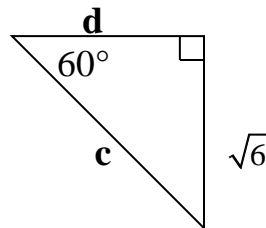
Special Right Triangles:

Solve for the missing side lengths. Your answer should be in simplified radical form, NO DECIMALS.
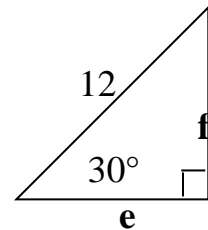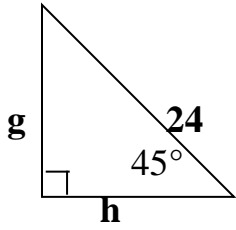
73.

74.

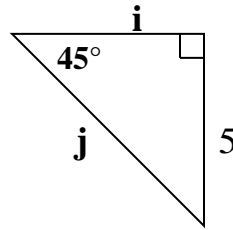
75.

a = _____ b = _____   c = _____ d = _____   e = _____ f = _____
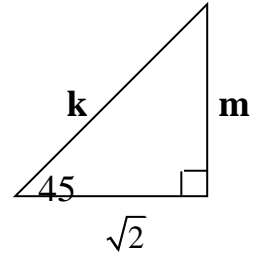
76.

77.

78.
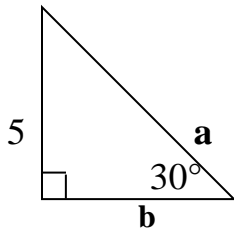
g = _____ h = _____   i = _____ j = _____   k = _____ m = _____
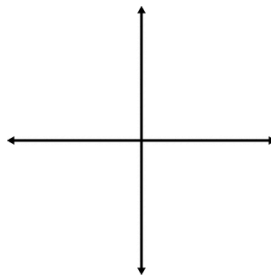
(13-2) Unit Circle

79. Draw an angle with the given measure in standard position.
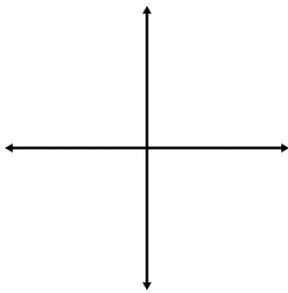
a. 140°   b. $-240°$ c. 640°
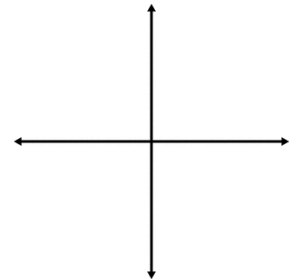
(13-3) Angles in the Unit Circle

80.

a) $\sin 30°$ = _____   **b)** $\tan 60°$ = _____   **c)** $\cos 45°$ = _____

d) tan 90° = _____   **e)** cos (-60°) = _____   **f)** sin(-135°) = _____

g) sin 360° = _____   **h)** tan 180° = _____   **i)** cos (-90°) = _____

81.   Sketch the graph of a 240 degree angle and then find the exact trig values.
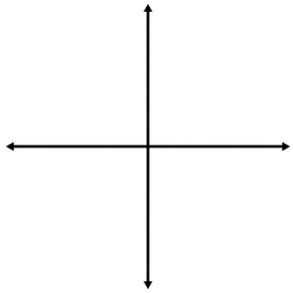
Reference angle =

$\sin 240° =$

$\cos 240° =$

$\tan 240° =$

(10-1) Exponential Functions

Write an exponential function whose graph passes through the given points.

82. $(0,6)$ $(3,48)$ 83. $(0,5)$ $(2,45)$

Solve for x:

84. $3^{x-2} = 27$ 85. $5^{x+5} = 125$ 86. $10^{x-1} = 100^{2x-3}$