

CP Algebra II Final Exam Review 2018

5.3 Dividing Polynomials:

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

$$\boxed{4xy^2 + 1 - 5x^3y^5}$$

Use synthetic division to simplify:

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

$$\begin{array}{r|rrrrrr} -10 & 1 & 9 & -1 & 80 & -100 & \\ & & \downarrow & -10 & 10 & -90 & 100 \\ \hline & 1 & -1 & 9 & -10 & 0 & \end{array}$$

$$\boxed{x^3 - x^2 + 9x - 10}$$

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

$$b^4 + 6b^3 + \underline{0b^2} + 6b + 32$$

$$\begin{array}{r|rrrrr} -6 & 1 & 6 & 0 & 6 & 32 & \\ & & \downarrow & -6 & 0 & 0 & -36 \\ \hline & 1 & 0 & 0 & 6 & -4 & \\ & b^3 & b^2 & b & & & \end{array}$$

$$\boxed{b^3 + 6 - \left(\frac{4}{b+6}\right)}$$

5.6 Radical Expressions:

Simplify:

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

$$\begin{aligned} & -3 \cdot \sqrt{4} \cdot \sqrt{5} + 15 \cdot \sqrt{9} \cdot \sqrt{5} - 6 \cdot \sqrt{16} \cdot \sqrt{5} + 10 \cdot \sqrt{100} \cdot \sqrt{5} \\ & -3 \cdot 2\sqrt{5} + 15 \cdot 3 \cdot \sqrt{5} - 6 \cdot 4 \cdot \sqrt{5} + 10 \cdot 10 \cdot \sqrt{5} \\ & -6\sqrt{5} + 45\sqrt{5} - 24\sqrt{5} + 100\sqrt{5} \end{aligned}$$

$$\boxed{115\sqrt{5}}$$

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

$$36\sqrt{25}$$

$$36 \cdot 5$$

$$\boxed{180}$$

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

$$(3-\sqrt{5})(3-\sqrt{5})$$

$$9-3\sqrt{5}-3\sqrt{5}+\sqrt{25}$$

$$9-6\sqrt{5}+5$$

$$\boxed{14-6\sqrt{5}}$$

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

$$3 \cdot b \cdot \sqrt{4} \cdot \sqrt{6} \cdot \sqrt{a^2} \cdot \sqrt{a} \cdot \sqrt{b^8} \cdot \sqrt{c}$$

$$3 \cdot b \cdot 2 \cdot \sqrt{6} \cdot a \cdot \sqrt{a} \cdot b^4 \cdot \sqrt{c}$$

$$\boxed{6ab^5\sqrt{6ac}}$$

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

$$x^2 - x\sqrt{10} + x\sqrt{10} - \sqrt{100}$$

$$\boxed{x^2 - 10}$$

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

$$-3 \cdot 2 \cdot \sqrt{6} \cdot \sqrt{3}$$

$$-6\sqrt{18}$$

$$-6 \cdot \sqrt{9} \cdot \sqrt{2}$$

$$-6 \cdot 3 \cdot \sqrt{2}$$

$$\boxed{-18\sqrt{2}}$$

Rationalize the denominator:

$$10. \frac{5}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$$

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

$$11. \frac{10}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}}$$

$$\frac{10\sqrt{5}}{5} = \boxed{2\sqrt{5}}$$

$$12. \frac{\sqrt{6}}{\sqrt{3}} = \sqrt{\frac{6}{3}} = \boxed{\sqrt{2}}$$

or

$$\frac{\sqrt{6}}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{18}}{3} = \frac{\sqrt{9} \cdot \sqrt{2}}{3}$$

$$\frac{3\sqrt{2}}{3}$$

(5-9) Complex Numbers

Simplify: $i^2 = -1$ $i = \sqrt{-1}$

$$13. -2i \cdot 7i$$

$$-14i^2$$

$$-14(-1)$$

$$\boxed{14}$$

$$14. \sqrt{100}$$

$$i\sqrt{100}$$

$$i \cdot 10$$

$$\boxed{10i}$$

$$15. \sqrt{-120}$$

$$i\sqrt{120}$$

$$i \cdot \sqrt{4} \cdot \sqrt{30}$$

$$i \cdot 2 \cdot \sqrt{30}$$

$$\boxed{2i\sqrt{30}}$$

$$16. -12i^2$$

$$-12(-1)$$

$$\boxed{12}$$

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

$$6 + 15i - 8i - 20i^2$$

$$6 + 7i + 20$$

$$\boxed{26 + 7i}$$

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

$$(2-7i)(2-7i)$$

$$4 - 14i - 14i + 49i^2$$

$$4 - 28i - 49$$

$$\boxed{-45 - 28i}$$

Add

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

$1 - 12i$

Subtract

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

$6+3i - 2+10i$

$4 + 13i$

21. i^{16}

$(i^2)^8 = (-1)^8 = 1$

22. $i^{23} = i^{22} \cdot i$

$(i^2)^{11} \cdot i \rightarrow (-1)^{11} \cdot i$

$-1 \cdot i$
 $-i$

Simplify

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

$i\sqrt{10} \cdot i\sqrt{15}$

$i^2 \sqrt{150} \rightarrow -1 \cdot 5 \cdot \sqrt{6}$

$-1 \cdot \sqrt{25} \cdot \sqrt{6}$
 $-5\sqrt{6}$

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

$12i^2$

$12(-1)$

-12

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

$x^2 - 3x + 3 = -7x + 15$
 $+7x \quad +7x$

$x^2 + 4x + 3 = 15$
 $-15 \quad -15$

$x^2 + 4x - 12 = 0$

$(x+6)(x-2) = 0$

$x+6=0 \quad x-2=0$

Solutions

$x = -6$

$x = 2$

$\rightarrow (-6) + (2)$

-4

Solve:

26. $3x^2 + 48 = 0$
 $-48 \quad -48$

$\frac{3x^2}{3} = \frac{-48}{3}$

$x^2 = -16$

$x = \sqrt{-16}$

$i\sqrt{16}$

$4i$

27. $4x^2 = -32$

$x^2 = -8$

$x = \sqrt{-8}$

$i\sqrt{8}$

$i \cdot \sqrt{4} \cdot \sqrt{2}$

$i \cdot 2 \cdot \sqrt{2}$

$2i\sqrt{2}$

$$2x - 3 = 0 \rightarrow 2x = 3 \rightarrow x = \frac{3}{2}$$

$$x + 5 = 0 \rightarrow x = -5$$

(6-3) Solve by factoring:

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

$$2x^2 + 7x - 15 = 0$$

$$(2x^2 - 3x) + (10x - 15) = 0$$

$$x(2x - 3) + 5(2x - 3) = 0$$

$$(2x - 3)(x + 5) = 0$$

29. $x^2 = 6x$

$$x^2 - 6x = 0$$

$$x(x - 6) = 0$$

$$x = 0$$

$$x - 6 = 0$$

$$x = 6$$

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

$$x^2 + 3x - 18 = 0$$

$$(x + 6)(x - 3) = 0$$

$$x + 6 = 0$$

$$x - 3 = 0$$

$$x = -6$$

$$x = 3$$

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

$$x^2 - 16x + 64 = 0$$

$$(x - 8)(x - 8) = 0$$

$$x - 8 = 0$$

$$x = 8$$

(6-5) Quadratic Formula

Solve using the quadratic formula:

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

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

$$\frac{-(-11) \pm \sqrt{(-11)^2 - 4(1)(24)}}{2(1)}$$

$$\frac{11 \pm \sqrt{121 - 96}}{2} = \frac{11 \pm \sqrt{25}}{2} = \frac{11 \pm 5}{2}$$

$$\rightarrow \frac{11 + 5}{2} = \frac{16}{2} = 8$$

$$\rightarrow \frac{11 - 5}{2} = \frac{6}{2} = 3$$

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

$$14x^2 + 9x + 1 = 0$$

$$\frac{11 \pm 5}{2} = \frac{16}{2} = 8$$

$$\frac{11 - 5}{2} = \frac{6}{2} = 3$$

$$\frac{-(-9) \pm \sqrt{(-9)^2 - 4(14)(1)}}{2(14)}$$

$$\frac{-9 \pm \sqrt{81 - 56}}{28} = \frac{-9 \pm \sqrt{25}}{28}$$

$$\frac{-9 + 5}{28} = \frac{-4}{28} = -\frac{1}{7}$$

$$\frac{-9 - 5}{28} = \frac{-14}{28} = -\frac{1}{2}$$

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

34. -7, 4

$$x = -7$$

$$x = 4$$

$$x + 7 = 0$$

$$x - 4 = 0$$

$$(x + 7)(x - 4)$$

$$x^2 - 4x + 7x - 28$$

$$x^2 + 3x - 28$$

35. 0, 6

$$x = 0$$

$$x = 6$$

$$x - 6 = 0$$

$$x(x - 6)$$

$$x^2 - 6x + 0$$

(6-4) Completing the Square

$$\left(\frac{b}{2}\right)^2$$

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

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

$$\left(\frac{-14}{2}\right)^2$$
$$(-7)^2$$

49

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

$$\left(\frac{10}{2}\right)^2$$
$$(5)^2$$

25

Solve by completing the square:

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

$$x^2 - 8x + \boxed{16} = -15 + \boxed{16}$$
$$(x - 4)^2 = 1$$

$$x - 4 = \pm\sqrt{1}$$
$$x = 4 \pm 1 \rightarrow \begin{matrix} 5 \\ 3 \end{matrix}$$

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

$$x^2 + 2x + \boxed{1} = 120 + \boxed{1}$$
$$(x + 1)^2 = 121$$

$$x + 1 = \pm\sqrt{121}$$
$$x = -1 \pm 11 \rightarrow \begin{matrix} 10 \\ -12 \end{matrix}$$

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

$$x^2 - 4x + \boxed{4} = -1 + \boxed{4}$$
$$(x - 2)^2 = 3$$

$$x - 2 = \pm\sqrt{3}$$

$$x = 2 \pm \sqrt{3}$$

or

$$3.732 \text{ + } 0.268$$

(6-6) Vertex Form

$$y = (x-h)^2 + k \rightarrow \text{Vertex} = (h, k)$$

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

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

$$x^2 - 12x + \boxed{36} = y - 23 + \boxed{36}$$

$$(x-6)^2 = y + 13$$

$$(x-6)^2 - 13 = y$$

Vertex (6, -13)

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

$$x^2 + x + \boxed{\frac{1}{4}} = y + 17 + \boxed{\frac{1}{4}}$$

$$(x + \frac{1}{2})^2 = y + 17.25 \quad \frac{69}{4}$$

$$(x + \frac{1}{2})^2 - 17.25 = y$$

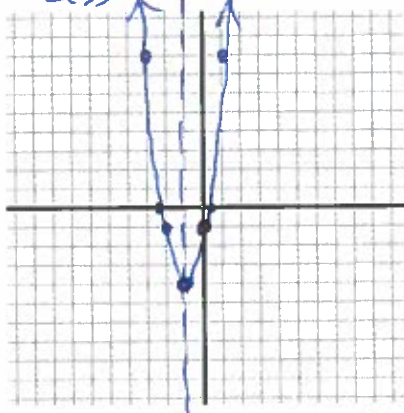
Vertex (-1/2, -69/4)
-17.25

(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.

$$(-\frac{b}{2a}, \text{ plug in } c)$$

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

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



(-3, 8)
(1, 8)

Axis of symmetry x = -1

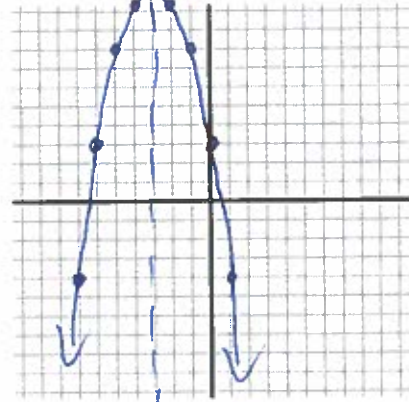
Vertex (-1, -4) → Minimum

y-intercept -1

x-intercepts -2.15 & 0.15

46. $y = -x^2 - 6x + 3$

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



(-4, 11)
(-2, 11)
(-5, 8)
(-1, 8)
(-7, -4)
(1, -4)

Axis of symmetry x = -3

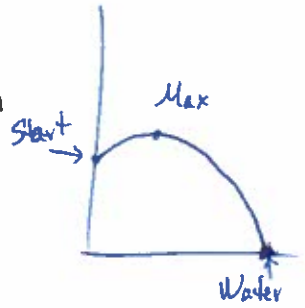
Vertex (-3, 12) → Maximum

y-intercept 3

x-intercepts -6.46 & 0.46

Quadratic Formula

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.

x-card

$$\frac{-(-8)}{2(-16)} = \frac{-8}{-32} = \frac{1}{4} \rightarrow 0.25 \text{ seconds}$$

Vertex \rightarrow (time, height)

b. Find the maximum height of the diver.

y-card

$$-16(0.25)^2 + 8(0.25) + 30 = 31 \text{ ft}$$

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

x-int \rightarrow Quad. Formula

$$\frac{-(-8) \pm \sqrt{(-8)^2 - 4(-16)(30)}}{2(-16)}$$

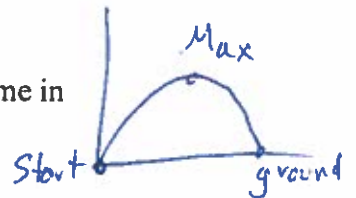
$$\frac{-8 \pm \sqrt{64 + 1920}}{-32} = \frac{-8 \pm \sqrt{1984}}{-32}$$

$\rightarrow -1.1419$
 $\rightarrow 1.642$

1.642 seconds

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?

x-int \rightarrow Quad Formula

$$\frac{-(-48) \pm \sqrt{(-48)^2 - 4(-16)(64)}}{2(-16)}$$

$$\frac{-48 \pm \sqrt{2304 + 4096}}{-32} = \frac{-48 \pm \sqrt{6400}}{-32} = \frac{-48 \pm 80}{-32}$$

$\rightarrow -1$
 $\rightarrow 4$

4 seconds

b) What is the maximum height the ball reaches?

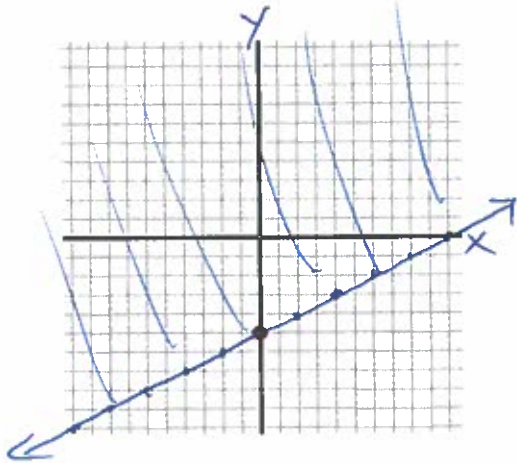
Vertex = (time, height)

$$\frac{-(-48)}{2(-16)} = \frac{-48}{-32} = 1.5 \text{ seconds}$$

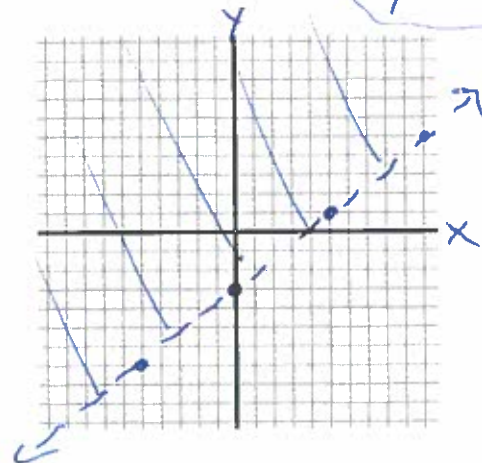
$$-16(1.5)^2 + 48(1.5) + 64 = 100 \text{ ft}$$

(2-7) Graph the following inequalities.

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



50. $4x - 5y - 10 < 5$



Handwritten work for problem 50:

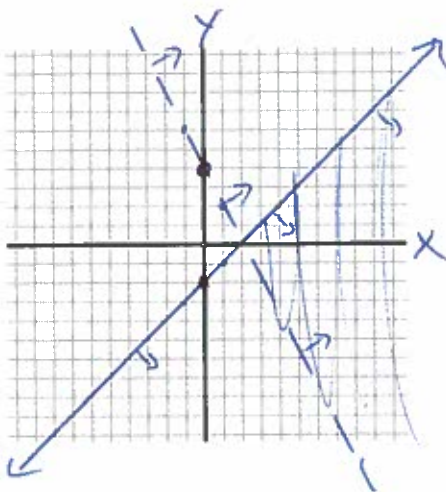
$$\frac{-5y}{-5} < \frac{-4x + 15}{-5}$$

$$\frac{-5y - 10}{+10} < \frac{-4x + 5}{+10}$$

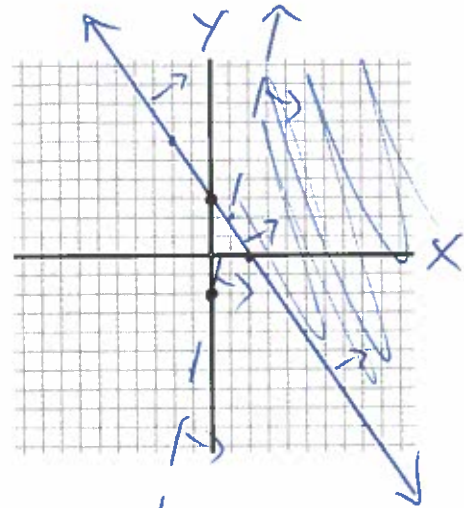
$$y > \frac{4}{5}x - 3$$

(3-3) Graph the following systems of equations on the coordinate plane.

51. $y > -2x + 4$
 $y \leq x - 2$



52. $3x + 2y \geq 6 \rightarrow y \geq -\frac{3}{2}x + 3$
 $4x - y > 2 \rightarrow y < 4x - 2$



(5-8) Solve for the variable.

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

$$\sqrt{4x + 8} = 2$$

$$4x + 8 = 4$$

$$4x = -4$$

$$x = -1$$

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

$$2t - 7 = t + 2$$

$$t - 7 = 2$$

$$t = 9$$

(9-1) Multiplying and Dividing Rational Expressions

Simplify:

$$55. \frac{\cancel{(x+y)}}{x^2-y^2} \cdot \frac{1}{\cancel{(x+y)}(x-y)}$$

$$\frac{1}{x-y}$$

$$56. \frac{5x^2y^3}{3a^5b^4} \div \frac{23x^5y}{42a^7b^3} = \frac{42a^7b^3}{23x^5y} = \frac{210a^7b^3x^2y^3}{64a^5b^4x^5y}$$

$$\frac{70a^{2-1}b^{-3}x^2y^2}{23}$$

$$\frac{70a^2y^2}{23bx^3}$$

$$57. \frac{\cancel{(x-5)}(x+2)}{2x^2+5x-3} \cdot \frac{\cancel{(x-4)}(2x-1)}{2x^2-9x+4} = \frac{2x^2-9x+4}{x^2-2x-15}$$

$$\frac{(x+2)(x-4)}{(x+3)(x+3)}$$

$$58. \frac{\cancel{(x+10)}(x-10)}{x^2+7x-30} \cdot \frac{\cancel{(x-3)}(x+2)}{x^2+9x+14} = \frac{(x-10)(x+2)}{(x+7)(x+2)}$$

$$\frac{x-10}{x+7}$$

$$59. \frac{\cancel{(x-5)}(x+4)}{x^3y^2} \cdot \frac{x^2y^3}{x^2-16} = \frac{y(x-5)}{x(x-4)}$$

$$\frac{y(x-5)}{x(x-4)}$$

$$\frac{x^2y^3}{x^3y^2} = \frac{y}{x}$$

(9-3) Graphing Rational Functions

60. Identify the x values of the asymptote and discontinuity $f(x) = \frac{(x+2)}{x^2-x-6} = \frac{1}{x-3}$

Vert. Asym. $\rightarrow x = 3$

Removable Discont. (Hole) $= (-2, -\frac{1}{5})$

61. Identify the x values of the asymptote and discontinuity $g(x) = \frac{x+5}{x^2+11x+30} = \frac{1}{x+6}$

Vert. Asym $\rightarrow x = -6$

Removable Discont. (Hole) $= (-5, 1)$

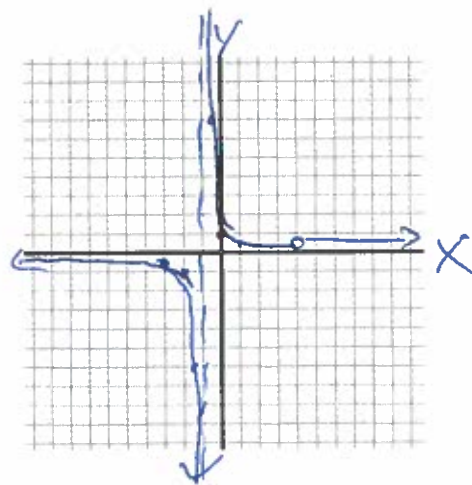
Identify the equation of the vertical asymptote and the discontinuity. Graph.

62. $k(x) = \frac{(x-5)}{x^2-4x-5} = \frac{1}{x+1}$

Simplified Function $\frac{1}{x+1}$

Vertical asymptote $x = -1$

Discontinuity $(5, \frac{1}{6})$

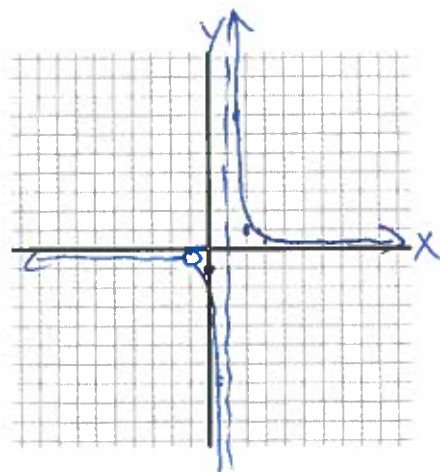


63. $m(x) = \frac{(x+1)}{x^2-1} = \frac{1}{x-1}$

Simplified Function $\frac{1}{x-1}$

Vertical asymptote $x = 1$

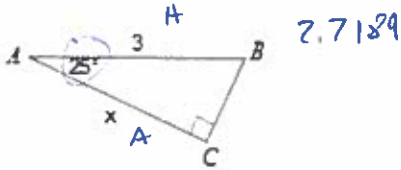
Discontinuity $(-1, -\frac{1}{2})$



(13-1) Right Triangle Trigonometry

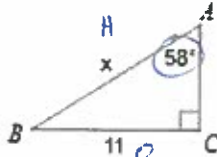
Write an equation involving the sin, cos and tan functions and solve for the missing side length. Round your answer to the nearest tenths place.

64. $\cos 25 = \frac{x}{3}$
 $3(\cos 25) = x$



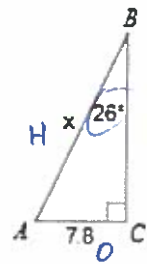
$x = 2.7$

65. $\sin 58 = \frac{11}{x}$
 $x(\sin 58) = 11$
 $x = \frac{11}{\sin 58}$
 12.9709



$x = 13.0$

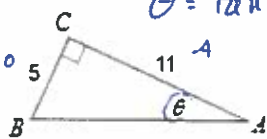
66. $\sin 26 = \frac{7.8}{x}$
 $x(\sin 26) = 7.8$
 $x = \frac{7.8}{\sin 26}$
 17.793



$x = 17.8$

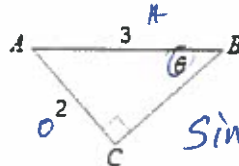
Write an equation involving the inverse trig functions to solve for the missing angle measure. Round your answer to the nearest whole degree.

67. $\tan \theta = \frac{5}{11}$
 $\theta = \tan^{-1}(\frac{5}{11})$
 24.443



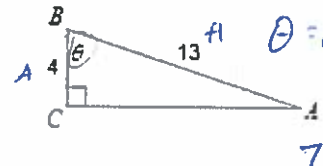
$\theta = 24^\circ$

68. $\sin \theta = \frac{2}{3}$
 $\theta = \sin^{-1}(\frac{2}{3})$
 41.81



$\theta = 42^\circ$

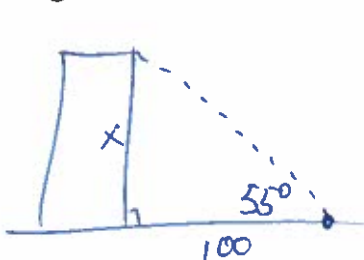
69. $\cos \theta = \frac{4}{13}$
 $\theta = \cos^{-1}(\frac{4}{13})$
 72.079



$\theta = 72$

Trig Applications with angle of elevation and depression:

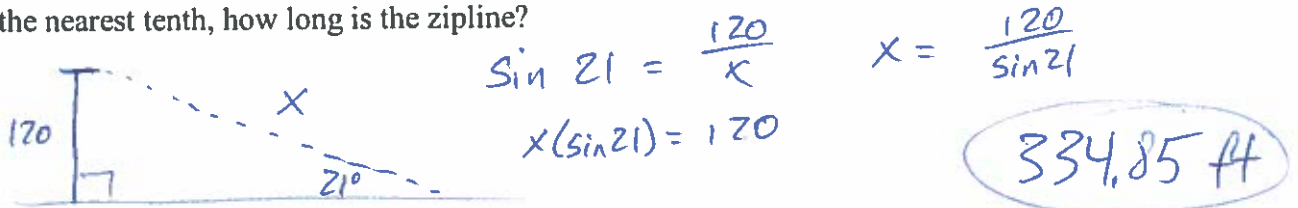
70. A surveyor stands 100 feet from a building and sights the top of the building at a 55 degree angle of elevation. Find the height of the building.



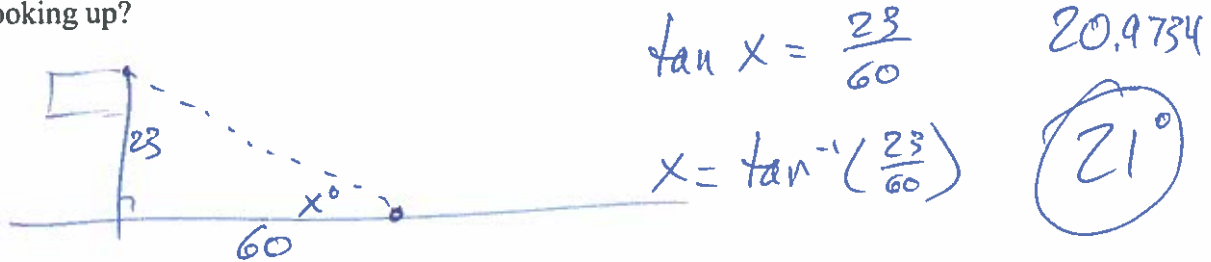
$\tan 55 = \frac{x}{100}$
 $100(\tan 55) = x$

142.815 ft

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?



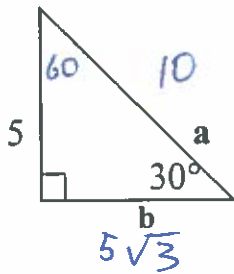
72. Matt is looking up at the top of a flag pole which is 23 feet tall. He is 60 feet away from the base of the pole. To the nearest degree, at what angle of elevation is Matt looking up?



Special Right Triangles:

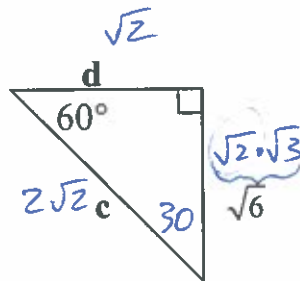
Solve for the missing side lengths. Your answer should be in simplified radical form, NO DECIMALS.

73.



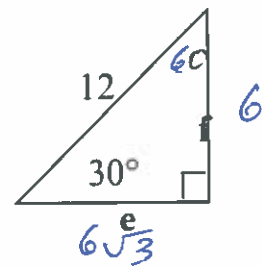
$a = 10$ $b = 5\sqrt{3}$

74.

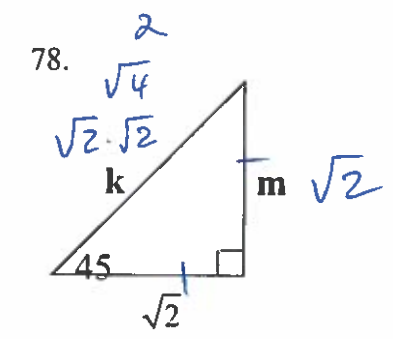
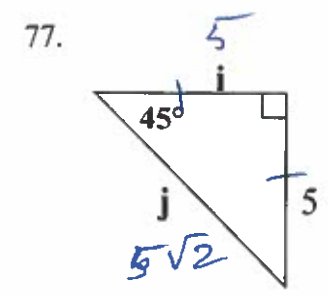
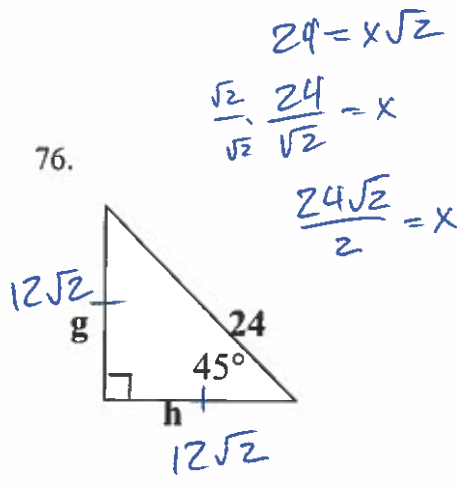


$c = 2\sqrt{2}$ $d = \sqrt{2}$

75.



$e = 6\sqrt{3}$ $f = 6$



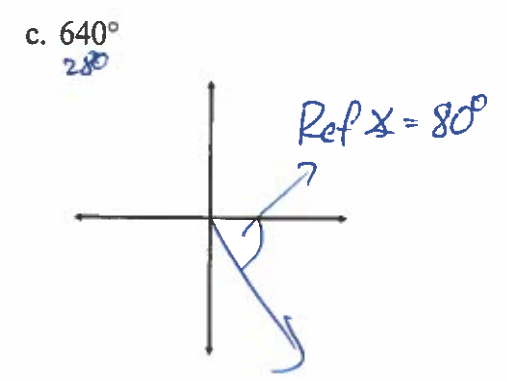
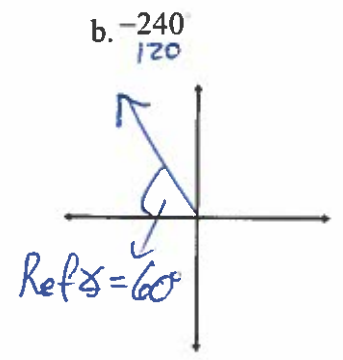
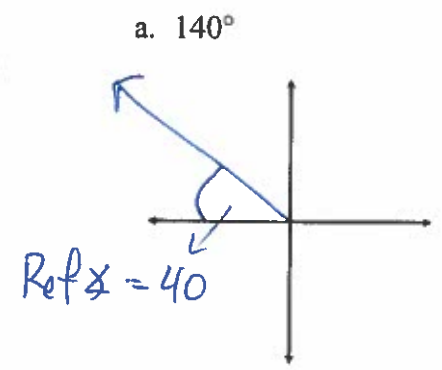
$g = 12\sqrt{2} \quad h = 12\sqrt{2}$

$i = 5 \quad j = 5$

$k = 2 \quad m = \sqrt{2}$

(13-2) Unit Circle

79. Draw an angle with the given measure in standard position.



(13-3) Angles in the Unit Circle

80. a) $\sin 30^\circ = \frac{1}{2}$

b) $\tan 60^\circ = \sqrt{3}$

c) $\cos 45^\circ = \frac{\sqrt{2}}{2}$

Q1
 $(\frac{\sqrt{3}}{2}, \frac{1}{2})$
 cos sin

Q1
 $(\frac{1}{2}, \frac{\sqrt{3}}{2})$
 cos sin

Q1
 $(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2})$
 cos sin

$\tan = 1$

$\tan = \frac{1}{2} \cdot \frac{2}{\sqrt{3}} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$

$\tan = \frac{\sqrt{3}}{2} \cdot \frac{2}{1} = \sqrt{3}$



$$\left(\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$$

cos sin

$$\left(-\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\right)$$

cos sin

d) $\tan 90^\circ = \text{Undefined}$

e) $\cos(-60^\circ) = \frac{1}{2}$

f) $\sin(-135^\circ) = -\frac{\sqrt{2}}{2}$

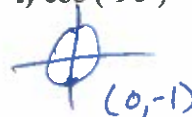
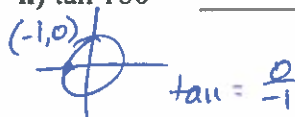
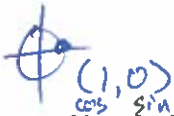
Q4
(+, -)

Q3 Ref $\angle = 45^\circ$
(-, -)

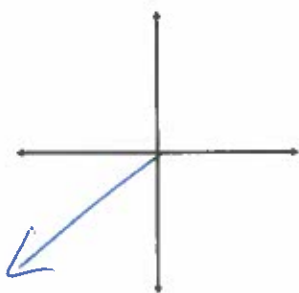
g) $\sin 360^\circ = 0$

h) $\tan 180^\circ = 0$

i) $\cos(-90^\circ) = 0$



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



Q3
(-, -)
cos sin
 $\left(-\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$
cos sin

Reference angle = 60

$\sin 240^\circ = -\frac{1}{2}$

$\cos 240^\circ = -\frac{\sqrt{3}}{2}$

$\tan 240^\circ = \sqrt{3}$

(10-1) Exponential Functions

$\tan -\frac{\sqrt{3}}{2} = -\frac{2}{1}$

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

82. (0,6) (3,48)
a x y

$y = a(b)^x$

83. (0,5) (2,45)
a x y

$45 = 5(b)^2$

$9 = b^2$
 $3 = b$

$48 = 6(b)^3$
 $\sqrt[3]{48} = \sqrt[3]{6^3}$

$y = 6(2)^x$

$y = 5(3)^x$

$2 = b$

Solve for x:

84. $3^{x-2} = 27 = 3^3$

85. $5^{x+5} = 125 = 5^3$

86. $10^{x-1} = 100^{2x-3} = (10^2)^{2x-3}$

$x-2 = 3$

$x+5 = 3$

$10^{x-1} = 10^{4x-6}$

$x = 5$

$x = -2$

$x-1 = 4x-6$

$-3x = -5$

$x = \frac{5}{3}$