Compass Practice

1) If $AB = D - 3AM$, and $D = 12$, $AB = .62$, Find AM $.62 = 12 - 3AM$ $\boxed{AM = 3.81}$

2) Find $|-5 - 3| - (-7 - 3 \cdot -2)^2 \cdot 3 + 4 = 8 - 1 \cdot 3 + 4 = 8 - 3 + 4$ $\boxed{9}$
   $8 - (-7 + 6)^2$

3) If $\det \begin{bmatrix} a & b \\ c & d \end{bmatrix} = ad - bc$, find $\det \begin{bmatrix} \frac{1}{2} & \frac{-2}{3} \\ 3 & 5 \end{bmatrix}$ $\boxed{4.5}$

4) If $r \Delta b = 3r - b$, find x if $4 \Delta x = 12$ $3(4) - x = 12$ $\boxed{x = 0}$

5) Find the difference in temperature from $32°$ to $-24°$ $\boxed{56°}$

6) Expand $(x^2 + 2x + 4)(x^2 + 3x - 2)$ $\boxed{x^4 + 5x^3 + 8x^2 + 8x - 8}$

7) If $x^2 + 3x + k = 0$, find k if $x = 2$ $k = -4 - 6 = \boxed{k = -10}$

8) Factor fully $16x^3y^3 - 20x^2y^3 + 6xy^3$ $\boxed{2xy^3(8x^2 - 10x + 3)}$

9) If $6(x - 2) - (2x - 3) = -(x - 3) - 2(x + 4)$ and find $5x!!$ $\frac{20}{7}$

10) Find a if $w = -3$ for $a = w^2 - w - 4 = 9 + 3 - 4 = \boxed{8}$

11) Simplify $\sqrt{32} \cdot \sqrt{2}$ $\boxed{= 8}$

12) If $R = M(D - W)$, find D if $R = 4$, $M = \frac{3}{4}$, $W = -2$ $\boxed{M = 3.33}$

13) Simplify, then Factor your result $(3x + 2)(x - 4) - (-2x^2 + 3x - 14)$ $\boxed{(5x - 3)(x - 2)}$

14) Factor fully $12x^4y - 32x^3y + 16x^2y$ $\boxed{2xy^3(8x^2 - 10x + 3)}$

15) Simplify, write answers fractional exponents $\sqrt[3]{8xy^4z^8}$ $\boxed{8^{1/3} x^{1/3} y^{4/3} z^{8/3}}$

16) Simplify, write answers as a radical $\sqrt[3]{8xy^4z^8}$ $\boxed{2yz^2 \sqrt[3]{xy z^2}}$

17) When $a = 4, b = 2$ find $2a\sqrt{4b} - 3b\sqrt{2a} + a\sqrt{18a}$ $\boxed{56 - 12\sqrt{6}}$

18) Expand $(4 - \sqrt{2})(3 - \sqrt{2})$ $\boxed{14 - 7\sqrt{6}}$

19) Find a slope parallel, and a slope perpendicular to a line through $(2,4)$ and $(5, -6)$ $\boxed{-\frac{10}{3}}$

20) Solve a^3 if $\frac{8}{\sqrt{a^3 + 10}} = 4$ $\boxed{-6}$

21) If Mike Jordan is 6.5 ft tall and 1.5 feet wide, how tall is his statue if the statue is 4 feet wide? $\boxed{x = 17.33}$

22) If $m \vee v = m^2 - v$, and $-4 \vee x = 14$, find $x!!!$ $\boxed{x = 2}$

23) If $i^2 = -1$, find $i^9, i^{18}, i^{24}, i^{35}$ $i, -1, 1, -i$

24) Lemon tea is made of lemon juice and tea. How much lemon juice should be added to 18 L of tea so that the mixture is 85% tea? $\boxed{2.7 L \text{ of lemon juice}}$

25) Solve $2x^3 - 3x^2 - 6x = -9$ $\boxed{x = \sqrt{3}, x = \frac{3}{2}}$

26) Find the sum of the solutions of $3x^2 - 16x + 5 = 0$. $\boxed{5.33}$

27) Find the slope of a line perpendicular to $3x - 5y = 8$. $\boxed{-\frac{5}{3}}$

28) $f(x) = 2x - 5$, $g(x) = -8 - x$, find $g(f(x))$, find $f(g(-3))$ $\boxed{-2x - 3}$ $\boxed{-15}$

29) The sum of 3 complex numbers is $12 - 4i$, the sum of 2 of those complex numbers is $-6 - 8i$. What is the 3rd number?

30) $f(x) = 2x + 6$, $g(x) = -x - 4$, $h(x) = -3x + 10$, find $[g(x) - f(x)] \cdot h(x)$ $\boxed{9x^2 - 100}$

31) Expand and simplify $(2 - 4i)(3 - 5i)$ $\boxed{-14 - 22i}$

32) $f(x) = 2x - 5$, $g(x) = -x - 4$ find $\frac{f(3) - g(-2)}{f(2) \cdot f(-6)}$ $\boxed{\frac{3}{17}}$

33) $f(x) = x^2 - 4x + 2$, $g(x) = x^2 + 3x - 4$, find $2f(x) - g(x)$ $\boxed{x^2 - 11x + 8}$

34) Simplify $(4i)^2$ $\boxed{-16}$

35) Tom reads x pages a day, Jerry reads 3 more pages a day. It takes Tom 14 days to finish a book, while it only takes Jerry 11 days to finish the same book. How many pages a day does each person read? $\boxed{Tom = 154 \text{ pages} \, \& \, Jerry}$

36) Given the coordinates $(4,8)$ $(2, -2)$,

   a) write and equation of a line thru those 2 points? $y = 5x - 12$

   b) what is the distance between those 2 points? $\sqrt{104} = 2\sqrt{13}$

c) what is the midpoint of those 2 points? $(3, 3)$

d) find a slope of a line that is Parallel to the line thru those 2 points? Perpendicular? $\parallel = 5 \quad \perp = -\frac{1}{5}$

37) Are the following arithmetic, geometric, neither:

a) -3, -6, -9, -12.......... arithmetic

b) 40, -20, 10, -5, ... geometric

38) Your truck gets 16 miles per gallon for gas. If you drive 200 miles to Wally World, and gas costs \$2.05 a gallon, find the cost to drive to Wally World. 25.63

39) Find the 11th term of 3, 6, 9, 12........ 33

40) 10 juniors averaged an 80 on the last test, while 18 seniors averaged an 88. What was the average of all 28 students? 85%

41) You average a 77% on the last 3 tests, what do you need to score on the next test to average a B (80%). 89%

42) Graph $y = x^2 + 4x + 3$ label the vertex, x-intercepts, and y intercepts $V: (-2, -1)$ $xint: -1, -3$ $yint: 3$

43) Solve for x: $\frac{1}{2}(x - 4)^2 - 8 = 1$ $x = 22$

44) If $\frac{x+2}{4} = \frac{-3x+1}{-8}$, find 5x !!!!! $5(5) = 25$

45) What would x have to be if you were given sequence 6, x, 24, -48, 96, -192...... -12

46) Solve for x if $4x(2x - 5)(3x + 7) = 0$ $x = 0, \ x = 5/2, \ x = -7/3$

47) Solve for k: $\frac{x^2 + kx - 12}{(x-3)} = (x + 4)$ 1

48) 10 less than twice a number is 20% of that same number. What is 3 times that number? 15.3

49) Taking a road trip to see the largest ball of twine, the ratio of miles spent on the highway to miles spent on the back roads was 2:3 . If the total trip was 375 miles, how many miles did you spend on the highway? 250 miles

50) You have \$200 to spend on an cell phone that costs 120 pesos. If \$3= 2 pesos, how many DOLLARS will you have left after buying the phone? $\$20$

51) If $a = \frac{2}{3}, b = 2\frac{1}{2}, c = 1\frac{3}{4}$, find $\frac{b-a}{c+a}$ $= 22/29$

52) Solve for x if $12 = \frac{3}{4}(a + x)$ $16 - a = x$

53) Solve for x if $\frac{m}{x} - v = f$ $x = \frac{m}{f+v}$

54) You purchase \$40 worth of pancakes at IHOP, then use a 15% off coupon. If tax, which is 7%, is taken after the coupon, how much will you tip from the final total if you tip 18%? $\$8.86$

55) What quadrant would you find the coordinate (-3,4)? II

56) What quadrant(s) would you find the line 2x-3y=9? I, III, IV

57) If d= 3b+5c and b= 2c-4, find d when c=5. 43

58) $\frac{\sqrt{8}}{3} + \frac{\sqrt{72}}{12}$ Simplify fully!! $\frac{7\sqrt{2}}{6}$

59) Expand $(2x - 3)^2$ $4x^2 - 12x + 9$

60) Simplify fully $\frac{x^2 - 5x + 6}{x^2 - 4}$ $\frac{x-3}{x+2}$

61) Solve for x: $2\frac{3}{4}x - \frac{1}{3} = 1\frac{1}{2}$ $x = \frac{2}{3}$

62) Simplify fully $\frac{2x-4}{\frac{5}{x-2}}$ $\frac{2x-4}{1} \cdot \frac{x-2}{5} = \frac{2(x-2)(x-2)}{5} = \frac{2(x-2)^2}{5}$

63) On a 50 question exam, made up of 20 multiple choice questions, and 30 free response questions, you get 15% of the multiple choice questions wrong, and the free response you get $\frac{3}{5}$ of the questions correct. What was your final grade on the test? $\frac{35}{50} = 70\%$

64) If you increase \$42 by 15%, then decrease that new amount by 20%, how much would you have? $\$38.64$

65) Simplify $\sqrt[3]{\frac{27}{64}}$ $= \frac{3}{4}$

66) The ratio of length to width of a fenced in rectangular garden is 2:5. If the perimeter of the garden is 56 feet, find the area of the garden. *160 feet²*

67) The population of students at Polk High was at 1,200 students this year. The year before was 16% less than this year, and next year is expected to be 22% more than this year. Find the difference of the number of students from last year to next year. *456 students*

68) $Simplify \quad 2\sqrt{12} \cdot 3\sqrt{6}$ $= 6\sqrt{72} = 6 \cdot 6\sqrt{2} = \boxed{36\sqrt{2}}$

69) $Find \quad 16^{\frac{-5}{4}}$ $= \boxed{\frac{1}{32}}$

70) $Simplify \quad \dfrac{2x^3y^{-4}z^8}{(4x^7y^{-2}z^3)(3x^2y^{-3}z)^{\frac{1}{2}}}$ $\dfrac{y^4z^3}{18x^8}$

71) $Write\ in\ radical\ form \quad x^{\frac{3}{4}}\ y^{\frac{1}{3}}\ z^{\frac{7}{5}}$ $\quad \sqrt[4]{x^3} \cdot \sqrt[3]{y} \cdot \sqrt[5]{z^7}$

72) $Simplify\ and\ write\ the\ answer\ in\ radical\ form \quad \dfrac{x^{\frac{1}{2}}y^{\frac{2}{3}}}{x^{\frac{1}{4}}y^{\frac{1}{2}}}$ $= x^{1/4}y^{1/6} \quad \boxed{\sqrt[4]{x}\ \sqrt[6]{y}}$

73) $Write\ in\ exponential\ form\ \sqrt[5]{x^3}$ $= \boxed{x^{3/5}}$

74) $Find\ \log_2 8\ -\ \log_{16} 4$

75) $Expand \quad \log_2 \dfrac{5x^3\sqrt{w}}{y^4\sqrt[3]{m^2}}$

76) $Condense \quad 2\log x + \frac{2}{3}\log y - 3\log z + \frac{1}{2}\log w$

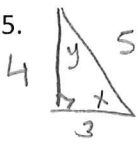77) Solve $\ 4^x = 8$ $\quad 4^x = 4^{1.5} \quad \boxed{x = 1.5}$

78) Solve $\ 3^x = \frac{1}{27}$ $\quad 3^x = 3^{-3} \quad \boxed{x = -3}$

79) Given a right triangle with a leg of 8 feet and hypotenuse of 12 feet, find the length of the other leg. $\boxed{4\sqrt{5}}$

80) A ladder that is leaning against a house makes an angle of elevation of 30 degrees with the ground. How far is the base of the ladder from the base of the house? $\boxed{\sqrt{3}}$

81) Find all angles of a right triangle with sides of 3, 4, 5. $\boxed{53.1°\ \&\ 36.9°}$

$\sin x = \frac{4}{5}$ $\sin y = \frac{3}{5}$

53.1 36.9

8) $16x^3y^3 - 20x^2y^3 + 6xy^3$

$2xy^3(8x^2 - 10x + 3)$

9) $6(x-2) - (2x-3) = -(x-3) - 2(x+4)$

$6x - 12 - 2x + 3 = -x + 3 - 2x - 8$

$4x - 9 = -3x - 5$

$7x = 4$

$x = 4/7$

$5(4/7)$

$\boxed{\dfrac{20}{7}}$

13) $(3x+2)(x-4) - (-2x^2 + 3x - 14)$

$3x^2 - 12x + 2x - 8 + 2x^2 - 3x + 14$

$5x^2 - 13x + 6$

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

16) 8

$2yz^2\sqrt[3]{xyz^2}$

17) $2(4)\sqrt{4\cdot 2} - 3\cdot 2\sqrt{2\cdot 4} + 4\sqrt{18\cdot 2}$

$\sqrt{8}$

$2\sqrt{2}$

$8\sqrt{16} - 6\sqrt{8} + 4\sqrt{36}$

$8\cdot 4 - 12\sqrt{2} + 4\cdot 6$

$56 - 12\sqrt{2}$

18) $12 - 4\sqrt{2} - 3\sqrt{2} + 2$

$12 - 7\sqrt{2} + 2$

19) $\dfrac{-6-4}{5-2} = \dfrac{-10}{3}$

20) $\dfrac{8}{\sqrt{a^3+10}} = 4$

$8 = 4\sqrt{a^3+10}$

$2 = \sqrt{a^3+10}$

$4 = a^3 + 10$

$-6 = a^3$

21.) $\dfrac{6.5}{1.5} = \dfrac{x}{4}$

22) $(-4)^2 - x = 14$

$-x = -2$

$x = 2$

24 1) 2.7 L

25) $2x^3 - 3x^2 - 6x + 9 = 0$

$x^2(2x-3) - 3(2x-3) = 0$

$(x^2 - 3)(2x-3) = 0$

$x = \sqrt{3} \qquad x = \dfrac{3}{2}$

26) $3x^2 - 16x + 5 = 0$

$x = 5 \qquad x = .33$

$5 + .33$

27) $y = \dfrac{-3}{-5}x + \dfrac{8}{-5} \qquad m = \dfrac{3}{6} \qquad \perp = \dfrac{-5}{3}$

28) $-8 - (2x-5)$

$-8 - 2x + 5$

$-2x - 3$

$\dfrac{g(-3) - 8 - (-3)}{-8 + 3}$

-5

$\rightarrow$

$2(-5) - 5$

$-10 - 5$

-15

29)

30) $(-3x - 10) - 3x + 10$

$\dfrac{9x^2 - 30x + 30x - 100}{9x^2 - 100}$

31) $6 - 10i - 12i + 20i^2$

$6 - 22i - 20$

$-14 - 22i$

32) $\dfrac{6-5 - (2-4)}{(4-5)(-12-5)} = \dfrac{3}{17}$

33) $2x^2 - 8x + 4 - x^2 - 3x + 4$

$x^2 - 11x + 8$

35) $14x = 11(x+3)$ $3x = 33$ Tom $= 14(11)$
      $14x = 11x + 33$ $x = 11$ Jerry $=$

36) $\dfrac{-2-8}{2-4} = \dfrac{-10}{-2} = 5$ $-8 = 5(4) + b$

                       $-12 = b$

a) $y = 5x + {}^-12$

b) $\sqrt{(-10)^2 + (-2)^2} = \sqrt{100 + 4} = \sqrt{104}$

c) $\dfrac{6}{2}$ $\dfrac{6}{2}$

40) $\dfrac{x}{10} = 80$ | $\dfrac{x}{18} = 88$
     $x = 800$ 1584

41.) $\dfrac{x}{3} = 77$ | $\dfrac{231 + x}{4} = 80$
     $x = 231$ $x = 89$

43) $(x - 4) = 18$
      $x = 22$

44) $-8x - 16 = -12x + 4$
       $4x = 20$
        $x = 5$

47) $x^2 + kx - 12 = x^2 + 4x - 3x - 12$
          $kx - 12 = x - 12$
            $kx - x = 0$
             $x(k - 1) = 0$
               $k - 1 = 0$
               $\boxed{k = 1}$

48) $2x-10=.20$ $3(5.1)$
$x=5.1$ $\boxed{15.3}$

49) $\dfrac{2}{3} = \dfrac{250}{125}$ $\boxed{250}$

50) $\dfrac{x}{120 \text{ pesos}} = \dfrac{\$3}{2 \text{ pesos}}$ — $2x=360$
$x=180$

51) $\dfrac{2.5-\left(\frac{2}{3}\right)}{\frac{7}{14}+\frac{2}{3}} = \dfrac{\frac{11}{6}}{\frac{29}{12}} = \dfrac{11}{6}\cdot\dfrac{12}{29} = \dfrac{132}{174}$

52) $\dfrac{4(12)}{3} = 9+x$
$16 = 9+x$
$16-9 = x$

53) $\dfrac{m}{x} = f+v$ $x=\dfrac{m}{f+v}$
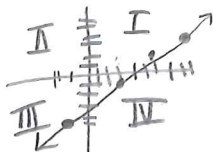$m = (f+v)x$
$\dfrac{m}{f+v} = \dfrac{(f+v)x}{f+v}$

54) $40(.15)=6$ $\$46(.07)$
$40+6=46$ $\$49.22$

56) $y = \dfrac{2}{3}x - 3$

57) $b = 6$

58) $\dfrac{2\sqrt{2}}{3} + \dfrac{6\sqrt{2}}{12} = \dfrac{8\sqrt{2}}{12} + \dfrac{6\sqrt{2}}{12} = \dfrac{14\sqrt{2}}{12} = \dfrac{7\sqrt{2}}{6}$

59) $(2x-3)(2x-3) = 4x^2-6x-6x+9$
$4x^2-12x+9$

60) $\dfrac{(x-3)(x-2)}{(x+2)(x-2)}$

61) $\dfrac{4}{4} \cdot x = \dfrac{11}{6_3} \cdot \dfrac{4^2}{11}$
$x = \dfrac{2}{3}$

62) $\dfrac{(2x-4)}{1} \cdot \dfrac{(x-2)}{5} = \dfrac{2x^2-4x-4x+8}{5}$
$= \dfrac{2x^2-8x+8}{5}$
$\dfrac{2(x^2-4x+4)}{5}$
$\dfrac{2(x-2)(x-2)}{5}$

63) MC $20(.15)=3$
$20-3=17$
FR $30\left(\dfrac{3}{5}\right)=18$
$17+18 = \dfrac{35}{50} = \boxed{70\%}$

66) $2x+2x+5x+5x=56$
$x=4$ $8(20)=160$

67) $1200(.16)=192 \to 1008$
$\boxed{456 \text{ students}}$ 1464

70) $\dfrac{2x^3y-4z^8}{4x^7y-2z^3\cdot3^2x^4y-6z^2} = \dfrac{}{36x^{11}y^{-8}z^5}$
$\boxed{\dfrac{y^4z^3}{18x^8}}$

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