Name Schlansky
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Date _____

SAT Assessment I

1. The solution set of $\sqrt{3x + 16} = x + 2$ is
1) {−3, 4}
2) {−4, 3}
3) {3}
4) {−4}

$X = 3$

$\sqrt{3(3) + 16} = 3 + 2$

$\sqrt{25} = 5$

$5 = 5$ ✓

$X = -4$

$\sqrt{3(-4) + 16} = -4 + 2$

$\sqrt{4} = -2$

$2 \neq -2$ ✗

2. Solve for m:

$$\left(\frac{1}{m+10}\right)\left(\frac{1}{5}\right) = \left(\frac{3}{m+10}\right)$$

LCD: $5(m+10)$

$5 + m + 10 = 15$

$m + 15 = 15$

$-15 \quad -15$

$m = 0$

3. Solve the following systems of equations for x and y

$\begin{cases} 2x + y = 3 \\ -x + 3y = -12 \end{cases}$

$2x + y = 3$
$-2x + 6y = -24$
$7y = -21$
$\frac{7y}{7} = \frac{-21}{7}$
$y = -3$

$2x + y = 3$
$2x - 3 = 3$
$+3 \quad +3$
$\frac{2x}{2} = \frac{6}{2}$
$x = 3$

$(3, -3)$

4. Solve the following systems of equations for x and y

$y = x + 3$

$3x + 2y = 26$

$3x + 2(x + 3) = 26$
$3x + 2x + 6 = 26$
$5x + 6 = 26$
$-6 \quad -6$

$\frac{5x}{5} = \frac{20}{5}$

$x = 4$

$y = x + 3$
$y = 4 + 3$
$y = 7$

5. If (x,y) is the solution to the following system, what is the value of x - y?

$\left| \begin{array}{l} (2x+3y=9) \\ -2(x-4y=-1) \end{array} \right.$

$2x+3y=9$
$2x+3(1)=9$
$2x+3=9$
$\underline{-3-3}$
$2x=6$
$x=3$

$+2x+3y=9$
$\underline{-2x+8y=2}$
$11y=11$
$\overline{11}\overline{11}$
$y=1$

$\begin{array}{c} x-y \\ 3-1 \\ \boxed{2} \end{array}$

6. Alicia purchased H half-gallons of ice cream for $3.50 each and P packages of ice cream cones for $2.50 each. She purchased 14 items and spent $43. Which system of equations could be used to determine how many of each item Alicia purchased?

1) $3.50H + 2.50P = 43$
   $H + P = 14$

2) $3.50P + 2.50H = 43$
   $P + H = 14$

$H + P = 14$
$3.50H + 2.50P = 43$

3) $3.50H + 2.50P = 14$
   $H + P = 43$

4) $3.50P + 2.50H = 14$
   $P + H = 43$

7. For what value of a does the equation $5x - 2 = 5x + a$ have infinitely many solutions?

1) 5   3) 2
2) -5   4) -2

8. For what value of a does the equation $ax - 2 = 5x + 3$ have no solutions?

1) 5   3) 2
2) -5   4) -2

9. Solve for t in terms of x and y:

$t\left(\dfrac{x}{t}\right)=t(y+1)$

$x = t(y+1)$

$\dfrac{x}{y+1} = \dfrac{t(y+1)}{y+1}$

$\dfrac{x}{y+1} = t$

10. If $3xy + 3z - 4 = 8$, what is the value of $xy + z$?

$$\frac{3xy + 3z = 12}{3} \quad \frac{}{3} \qquad xy + z = \boxed{4}$$

$+4 \quad +4$

11. The formula below can be used to find the power, P, given the current, I, and resistance, R.

$P = I^2 R$

If the current is doubled and the resistance is cut in half, how will the power be affected?

$\overline{2I} \qquad \overline{\frac{1}{2}R}$

$P = (2I)^2(\frac{1}{2}R)$

$P = (4I^2)(\frac{1}{2}R)$

$\rightarrow P = 2I^2 R$

Multiplied by 2

12. To make a certain bakery cookie, the maker needs 2.1 ounces of chocolate. How many pounds of chocolate are needed to make 32 cookies? (1 pound = 16 ounces)

$32 \text{ cookies} \cdot \frac{2.1 \text{ ounces}}{1 \text{ cookie}} \cdot \frac{1 \text{ pound}}{16 \text{ ounces}} = \frac{32(2.1)}{16} = 4.2 \text{ pounds}$

13. 60% of a class did their homework. If there are 20 students in the class, how many students did not do their homework?

40% of 20

$.4(20) = 8$

14. Byron purchases groceries that total $52. How much will his bill be after 7% sales tax is added?

$1.07(52)$

$\$55.64$

$1 + .07$

1.07

$1 - .10 = .9$

15. Chloe wants to buy a car that has an original price of $8000. The dealership is offering 10% off and her mom will pay for 25% of the final cost. How much will Chloe have to pay without tax?

$1 - .25 = .75$

$.9(.75)(8000) = \$5400$

16. A dress with an original price of $125 went on clearance for $68.75. What is the percent of decrease of the dress?

$$\frac{125}{-68.75}$$
$$\overline{56.25}$$

$\dfrac{\text{amount of change}}{\text{original}} = \dfrac{\text{percent of change}}{100}$

$\dfrac{56.25}{125} = \dfrac{x}{100}$
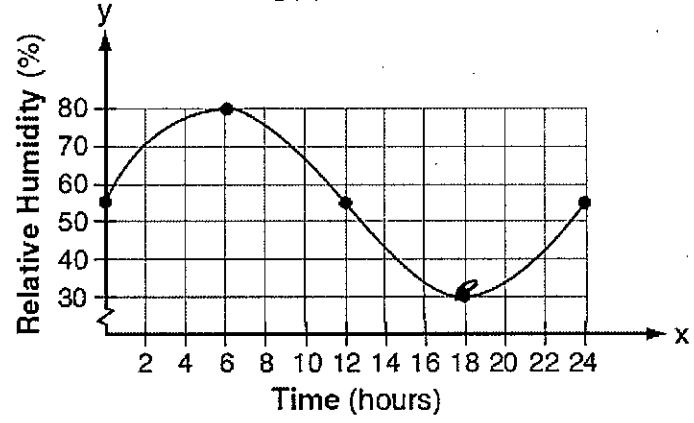
$\dfrac{125x}{125} = \dfrac{5625}{125}$

$x = 45$

17.   f(x)

g(x)
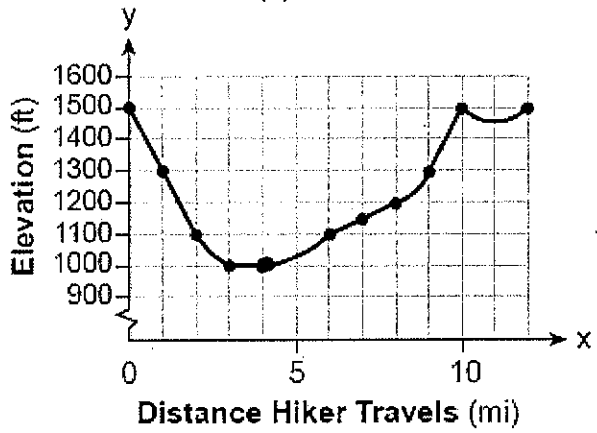
a) Evaluate f(4)

1000

b) Evaluate g(18)

30

18. The result when $6x^2 - 13x + 12$ is subtracted from $-3x^2 + 6x + 7$ is a polynomial in the form $ax^2 + bx + c$. What is the value of $a + b + c$?

$(-3x^2 + 6x + 7) - (6x^2 - 13x + 12)$

$-3x^2 + 6x + 7 - 6x^2 + 13x - 12$

$-9x^2 + 19x - 5$

$ax^2 + bx + c$

$a = -9$
$b = 19$
$c = -5$

$a + b + c$

$-9 + 19 + 5$

5

19. The product of $2x^2 + 7x - 10$ and $x + 5$ is expressed in its standard form of $ax^3 + bx^2 + cx + d$. What is $a + b - d$?

$(2x^2 + 7x - 10)(x + 5)$

	$2x^2$	$+7x$	-10
x	$2x^3$	$+7x^2$	$-10x$
$+5$	$+10x^2$	$35x$	-50

$2x^3 + 17x^2 + 25x - 50$

20. Which of the following is equivalent to $\sqrt{g^2 - 6gh + \sqrt{9h^2}}$?

1) $(g - 3)^2$
2) $(g + 3)^2$
3) $(g - 3h)^2$
4) $(g + 3h)^2$

$(g - 3h)^2$

21. Solve for h and k: $3x^3 - 8x^2 + 13 = (3x^2 + hx - 4)(x - 2) + k$

$3x^3 - 8x^2 + 0x + 13 = 3x^3 + (h - 6)x^2 + (-2h - 4)x + 8 + k$

$-8 = h - 6$ $0 = -2h - 4$ $13 = 8 + k$
$+6 \quad +6$ $+4 \quad +4$ $-8 \quad -8$
$-2 = h$ $\dfrac{4}{-2} = \dfrac{-2h}{-2}$ $5 = k$
                     $-2 = h$

	$3x^2$	$+hx$	-4
x	$3x^3$	$+hx^2$	$-4x$
-2	$-6x^2$	$-2hx$	$+8$

$3x^3 + (h - 6)x^2 + (-2h - 4)x + 8$

22. Add: $\dfrac{1}{2x+3}+\dfrac{4}{1}\dfrac{(2x+3)}{(2x+3)}$

$\dfrac{1}{2x+3}+\dfrac{4(2x+3)}{2x+3}$

$\dfrac{1+8x+12}{2x+3}$ $\dfrac{8x+13}{2x+3}$

23. Rationalize $\dfrac{3}{(2+5i)}\dfrac{(2-5i)}{(2-5i)}$

$\dfrac{6-15i}{4-10i+10i-25i^2}$

$\dfrac{6-15i}{4-25i^2}$

$\dfrac{6-15i}{4-25(-1)}$

$\dfrac{6-15i}{4+25}$

$\dfrac{6-15i}{29}$

$\dfrac{6}{29}-\dfrac{15}{29}i$

24. Divide using synthetic division:

$\dfrac{2x^3-x-2}{x-4}$

$2x^2+8x+31+\dfrac{122}{x-4}$

$$4\,\big|\begin{array}{cccc} 2 & 0 & -1 & -2 \\ \downarrow & 8 & 32 & 124 \\ \hline 2 & 8 & 31 & 122 \end{array}$$

25. Divide using long division:

$\dfrac{9x+3}{3x-2}$

$\boxed{3+\dfrac{9}{3x-2}}$

$3x-2\,\overline{)9x+3}$

$\underline{+9x+6}$

9

26. Which point lies on the line whose equation is 4x + 5y - 3 = 0?
1) (4,5)   2) (2,-3)   3) (-6,4)   ④ (2,-1)

x y

$4(2)+5(-1)-3=0$

$8-5-3=0$

$0=0$

27. The point $(x,3)$ is on the graph whose equation is $y = 2x+5$. What is the value of x?

$$x\,y$$

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

28. Which ordered pair is in the solution set of the following system:
$$2y > 3x+4$$
$$y+5 \geq -2x$$

1) $(3,2)$

2) $(-2,-1)$

3) $(-3,8)$

4) $(-8,2)$

$$x\,y$$
$$(-3,8)$$

$$2(8) > 3(-3)+4$$
$$16 > -5 \checkmark$$

$$8+5 \geq -2(-3)$$
$$13 \geq 6 \checkmark$$

29. Factor the following polynomials:

$$\frac{3x^2 + 9x - 12}{3} \quad \frac{}{3} \quad \frac{}{3}$$

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

$$3(x+4)(x-1)$$

$$\frac{6x^2 - 54}{6} \quad \frac{}{6}$$

$$6(x^2 - 9)$$

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

$$\left(\frac{x^3 + 10x^2}{x^2}\frac{-9x - 90}{-9}\right)$$

$$x^2(x+10) - 9(x+10)$$

$$(x^2 - 9)(x+10)$$

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

30. Which of the following is equivalent to $\sqrt{x^2 - 20}$?

$$\left(x+\sqrt{20}\right)\left(x-\sqrt{20}\right)$$

A) $(x-10)(x+2)$

B) $(x-10)(x+10)$

C) $(x+\sqrt{10})(x-\sqrt{10})$

D) $(x+\sqrt{20})(x-\sqrt{20})$

E) $(x-\sqrt{10})(x-\sqrt{10})$

31. Solve the following polynomial equations:

$x^3 + 5x^2 - 4x = 20$

$-20 - 20$

$x^3 + 5x^2 - 4x - 20 = 0$

$\dfrac{x^3}{x^2} \dfrac{5x^2}{x^2} \dfrac{-4}{} \dfrac{-4}{}$

$x^2(x+5) - 4(x+5) = 0$

$(x^2-4)(x+5) = 0$

$x^4 - 5x^2 = -4$

$+4 \quad +4$

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

$x+2=0 \quad x-2=0 \quad x+5=0$

$-2-2 \quad +2+2 \quad -5-5$

$x=-2 \quad x=2 \quad x=-5$

$x^4 - 5x^2 + 4 = 0$

$(x^2-4)(x^2-1) = 0$

$(x+2)(x-2)(x+1)(x-1) = 0$

$x+2=0 \quad x-2=0 \quad x+1=0 \quad x-1=0$

$-2-2 \quad +2+2 \quad -1-1 \quad +1+1$

$x=-2 \quad x=2 \quad x=-1 \quad x=1$

32. Danielle's age is 2 years less than Jessica's age. If the sum of their ages is 56, how old is Jessica?

D: $x-2$

J: $x=29$

$x + x - 2 = 56$

$2x - 2 = 56$

$+2 \quad +2$

$\dfrac{2x}{2} = \dfrac{58}{2}$

$x = 29$

$1 + 2 = 1.2$

33. Ben has 20% more DVDs than Jake has. If they have a total of 66 DVDs, how many DVDs does Jake have?

B: $1.2x$

J: $x=30$

$1.2x + 1x = 66$

$\dfrac{2.2x}{2.2} = \dfrac{66}{2.2}$

$x = 30$

34. A rectangle has an area of 24 square units. The width is 5 units less than the length. What is the length, in units, of the rectangle?

$A = 24$

$l = x$

$w = x - 5$

$A = lw$

$24 = x(x-5)$

$24 = x^2 - 5x$

$-24 \qquad -24$

$0 = x^2 - 5x - 24$

$0 = (x-8)(x+3)$

$x-8=0 \quad x+3=0$

$+8+8 \quad -3-3$

$x = 8 \qquad x = -3$

A per month

35. A satellite television company charges a one-time installation fee and a monthly service charge. The total cost is modeled by the function $y = 40 + 90x$. Which statement represents the meaning of each part of the function?   ITF   per x

1) y is the total cost, x is the number of months of service, $90 is the installation fee, and $40 is the service charge per month.
2) y is the total cost, x is the number of months of service, $40 is the installation fee, and $90 is the service charge per month.
3) x is the total cost, y is the number of months of service, $40 is the installation fee, and $90 is the service charge per month.
4) x is the total cost, y is the number of months of service, $90 is the installation fee, and $40 is the service charge per month.

36. Dylan invested $600 in a savings account at a 1.6% annual interest rate. He made no deposits or withdrawals on the account for 2 years. The interest was compounded annually. Find, to the *nearest cent*, the balance in the account after 2 years.

$A = A$
$P = 600$
$r = .016$
$t = 2$

$A = P(1 \pm r)^t$
$A = 600(1 + .016)^2$
$A = 600(1.016)^2$
$A = 619.35$

37. A car's depreciated value can be represented by the function $v(t) = 25500(.83)^t$. What was the initial value of the car and what is the depreciation rate?

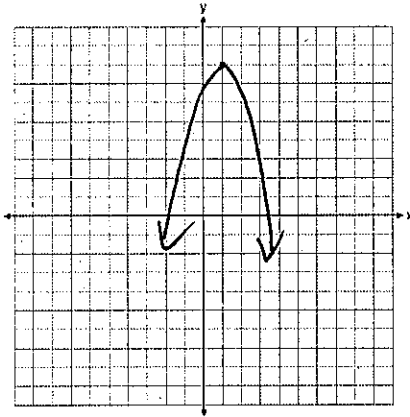initial value was $25,500

$1 - .83 = .17$
Depreciation rate is 17%.

38. A stock worth $8000 has been increasing by 8% every 5 months. What will be the value of the stock after 12 months?

$A = A$
$P = 8000$
$r = .08$
$t = 12$
$h = 5$

$A = P(1 \pm r)^{\frac{t}{h}}$
$A = 8000(1 + .08)^{\frac{12}{5}}$
$A = 8000(1.08)^{\frac{12}{5}}$
$A = \$9622.92$

39. What is the x coordinate of the vertex of a parabola whose roots are -2 and 4?
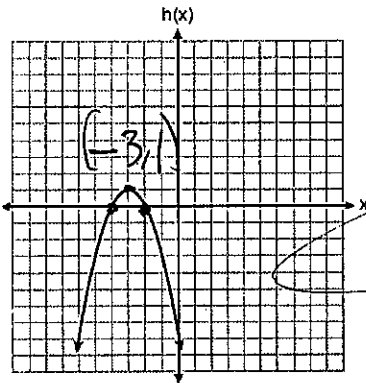
$x = 1$

opens down
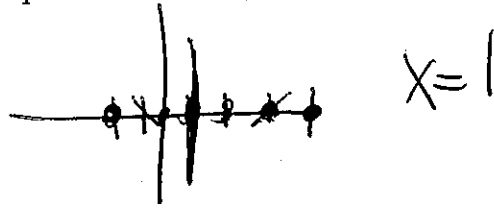
40. Sketch $y = -3(x-1)^2 + 8$ on the grid provided
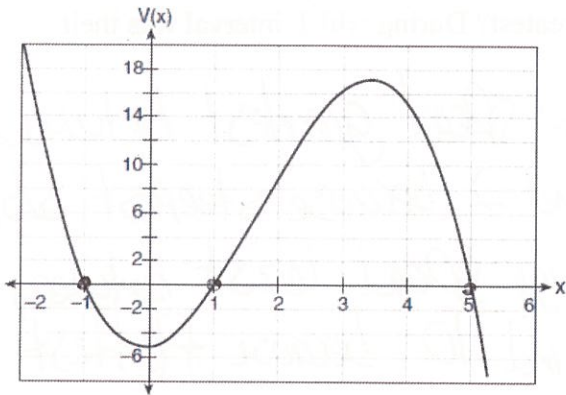
vertex: $(1, 8)$

41. Write the equation of the parabola below in vertex form AND factored form.

Vertex form

$y = (x-v)^2 + t$ vertex: $(-3, 1)$

$y = -(x+3)^2 + 1$

Factored form

$y = (x-a)(x-b)$

$y = (x+2)(x+4)$

zeros: -2 and -4

42. Write the equation of the polynomial graph below which passes through the point $(0, -5)$.

Zeros: $-1, 1, 5$

$$y = a(x+1)(x-1)(x-5)$$

$$-5 = a(0+1)(0-1)(0-5)$$

$$-5 = a(1)(-1)(-5)$$

$$\frac{-5}{5} = \frac{5a}{5}$$

$$-1 = a$$

$$y = -1(x+1)(x-1)(x-5)$$

43. Consider the polynomial $p(x) = x^3 + kx^2 + x + 6$. Find a value of k so that $x+1$ is a factor of P. Find all zeros of the polynomial.

$(-1, 0)$
$x y$

$$0 = (-1)^3 + K(-1)^2 + (-1) + 6$$

$$0 = -1 + K - 1 - 6$$

$$0 = K - 8$$

$$+8 \qquad +8$$

$$8 = K$$

44. The graph below models Craig's trip to visit his friend in another state. In the course of his travels, he encountered both highway and city driving. Based on the graph, during which interval did Craig most likely drive in the city? Explain your reasoning. Explain what might have happened in the interval between B and C.
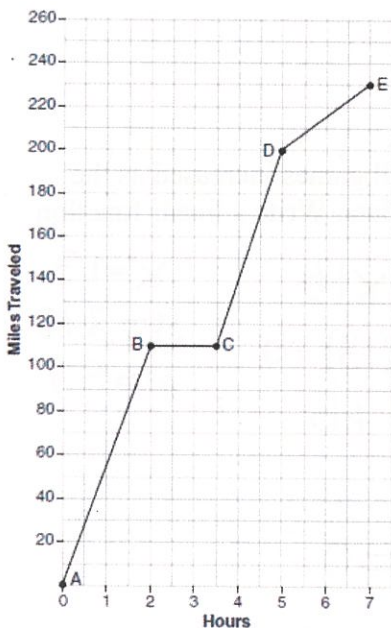

He drove in the city between D and E because the rate is slower.

Between B and C he stopped for lunch because he was not moving

45. The Jamison family kept a log of the distance they traveled during a trip, as represented by the graph below.
During which interval was their average speed the greatest? During which interval was their average speed the least?
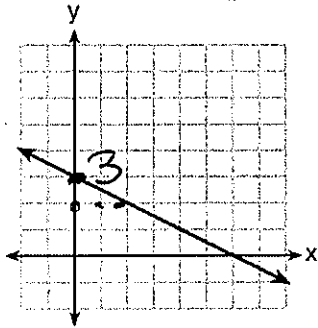
Distance Traveled (miles)

(10,390)
(8,350)
(6,230)
(4,180)
(2,110)
(1,40)

Elapsed Time (hours)
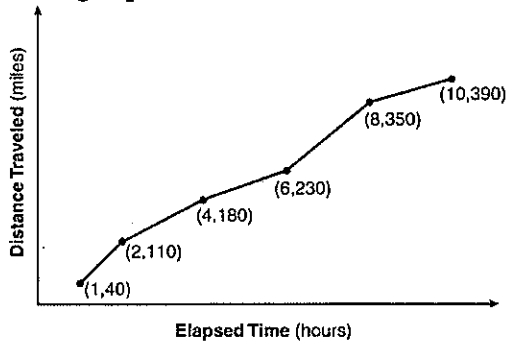
average speed greatest between
1 and 2 because steepest slope.
average speed least between
8 and 10 because flattest slope.

46. What is the slope of the line containing $(4,a)$ and $(6,b)$?

$$x_1 \; y_1 \qquad x_2 \; y_2$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\frac{b-a}{6-4} = \boxed{\frac{b-a}{2}}$$

47. What is the equation of the line given below?

$$b = 3 \qquad y = mx + b$$

$$m = \frac{-1}{2} \qquad y = \frac{-1}{2}x + 3$$

3

48. The number of people who attended a school's last six basketball games increased as the team neared the state sectional games. The table below shows the data. Write a linear function that represents this data.

Game	13	14	15	16	17	18
Attendance	348	435	522	609	696	783

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{435 - 348}{14 - 13}$$

$$m = 87$$

$$y = mx + b$$

$$348 = 87(13) + b$$

$$348 = 1131 + b$$

$$-1131 \quad -1131$$

$$-783 = b$$

$$y = 87x - 783$$
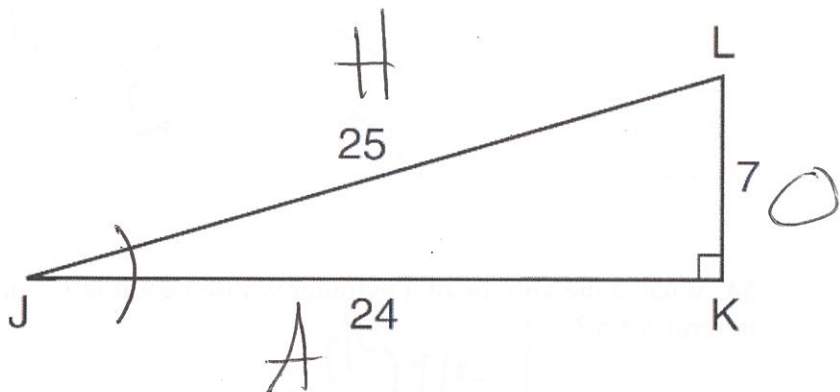
$$x = 13$$
$$y = 348$$
$$m = 87$$

$$S \frac{O}{H} \quad C \frac{A}{H} \quad T \frac{O}{A}$$

49. Find the following trig ratios for the given triangle.

$\sin J$ $\frac{O}{H} = \frac{7}{25}$

$\cos J$ $\frac{A}{H} = \frac{24}{25}$

$\tan J$ $\frac{O}{A} = \frac{7}{24}$

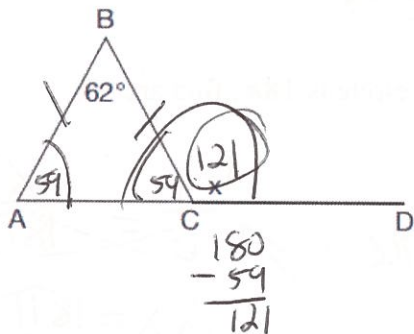50. In a right triangle, one angle measures x, where $\cos x = \frac{3}{4}$. What is $\sin(90 - x)$?
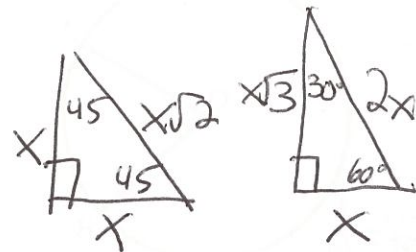
$\sin A = \cos B$
$A + B = 90$
$\sin x = \cos(90 - x)$

$\sin(90 - x) = \frac{3}{4}$

51. Given $\triangle ABC$ with $m\angle B = 62°$ and side $\overline{AC}$ extended to D, as shown below. Which value of x makes $\overline{AB} \cong \overline{CB}$?
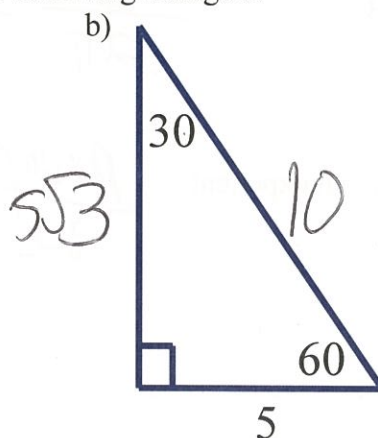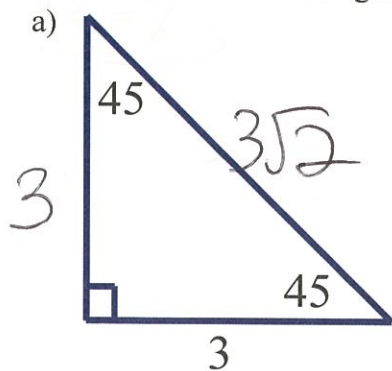
$\begin{array}{r} 180 \\ -62 \\ \hline 118 \end{array}$
$\frac{118}{2} = 59$
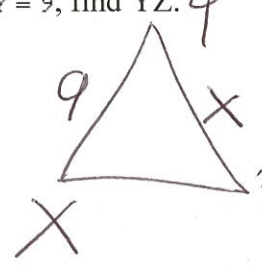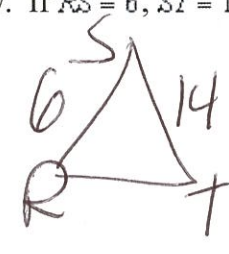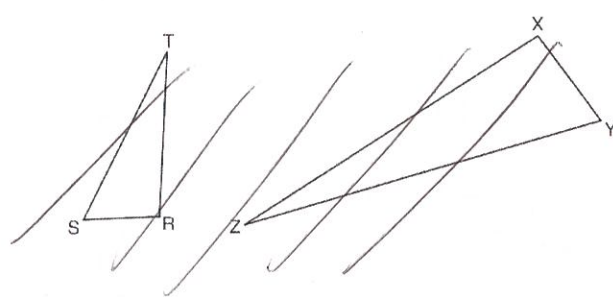

$\begin{array}{r} 180 \\ -59 \\ \hline 121 \end{array}$

52. Fill in the two missing sides of each of the following triangles.

a)

$3\sqrt{2}$

b)

$5\sqrt{3}$

53. Triangles *RST* and *XYZ* are drawn below. If *RS* = 6, *ST* = 14, *XY* = 9, find YZ.

$\frac{6}{9} = \frac{14}{x}$

$\frac{6x}{6} = \frac{126}{6}$

$x = 21$

(handwritten triangles: 6, 14, S, R, T; 9, x, X, Z)

54. What is the volume of a cylinder whose height is 12 inches and whose diameter is 20 inches in terms of π?

$V = \pi r^2 h$

$V = \pi (10)^2 (12)$

$V = 1200\pi$

55. The base of a pyramid is a rectangle with a width of 6 cm and a length of 8 cm. Find, in centimeters, the height of the pyramid if the volume is 288 cm^3.
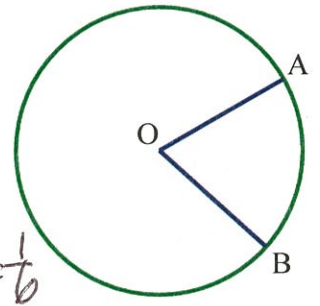
$V = \frac{1}{3} lwh$

$288 = \frac{1}{3}(6)(8)x$

$\frac{288}{16} = \frac{16x}{16}$

$18 = x$

56. In the circle below, $m\angle AOB = \dfrac{\pi}{3}$. If the circumference of the circle is 18π, find arc AB.

$\frac{\frac{\pi}{3}}{2\pi}$

$\frac{\pi}{3} \cdot \frac{1}{2\pi} = \frac{1}{6}$

(circle with center O, points A and B)

$\frac{\angle}{2\pi} = \frac{arc\ length}{circumference}$

$\frac{\frac{\pi}{3}}{2\pi} = \frac{x}{18\pi}$

$\frac{1}{6} = \frac{x}{18\pi}$

$\frac{6x}{6} = \frac{18\pi}{6}$

$x = 3\pi$

57. Express as a fractional exponent:

$\sqrt[3]{x^7}$

$\dfrac{power}{root}$

$x^{\frac{7}{3}}$

58. A public opinion poll was taken to explore the relationship between age and support for a candidate in an election. The results of the poll are summarized in the table below.

Age	For	Against	No Opinion
21–40	30	12	8
41–60	20	40	15
Over 60	25	35	15

(handwritten annotations: 50, 75, 75 beside rows; 75, 87, 38, 200 below columns)

Find the probability that a voter is between 21 and 60.

$50 + 75 = 125$ $\dfrac{125}{200}$

Find the probability that a voter is not for the candidate.

$87 + 38 = 125$ $\dfrac{125}{200}$

Find the probability that a voter over 60 is against the candidate.

$\dfrac{35}{75}$

59. The number of hours spent on math homework each week and the final exam grades for twelve students in Mr. Dylan's algebra class are plotted below.
Based on a line of best fit, which exam grade is the best prediction for a student who spends about 4 hours on math homework each week?

1) 62   3) 82
2) 72   4) 92

(option 2 circled)

Mr. Dylan's Class
Exam Grade (percent) vs. Time Spent on Math Homework (hours)
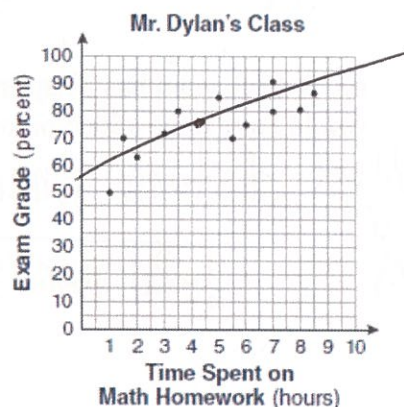
60. Sara's test scores in mathematics were 64, 80, 88, 78, 60, 92, 84, 76, 86, 78, 72, and 90. Determine the mean, the median, lower quartile, upper quartile, range, interquartile range, population standard deviation, and the mode of Sara's test scores.

1) Stat, Edit
2) Stat, Calc, 1-Var Stats

$\overline{x} = $ mean $= 79$
Med $=$ median $= 79$
Q1 $=$ lower quartile $= 74$
Q3 $=$ upper quartile $= 87$
range $=$ max $-$ min $= 92 - 60 = 32$
IQR $= Q3 - Q1 = 87 - 74 = 13$
$\sigma_x = $ Pop SD $= 9.5$
mode $= 78$

61. The table below represents the time taken, in minutes, to eat breakfast. For this set of data, find the mean, median, mode, standard deviation, range, and interquartile range. How many people were involved in this study?

Use $1varlist$
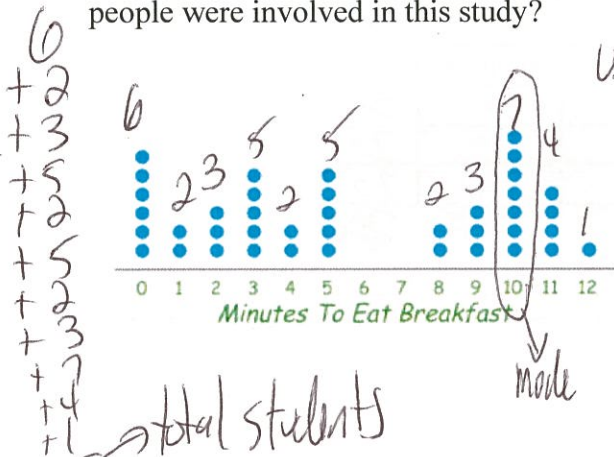
$\overline{x}$=mean = 5.625

Med=median = 5

mode = 10

$\sqrt{x}$ = SD = 4.0

range = Max-min = 12-0 =12

IQR = Q3-Q1 = 10-2 = 8

6
+2
+3
+5
+2
+5
+2
+3
+2
+4
+1
---
40 → total students

mode

62. On Jessica's first four math tests, she scored 74, 89, 80, and 82. What would Jessica have to score on her fifth math test to bring her average to an 84?

$mean = \dfrac{total\ points}{\#\ of\ tests}$

$84 = \dfrac{74+89+80+82+x}{5}$

$5(84) = \left(\dfrac{325+x}{5}\right)5$ x = 5ᵗʰ test score

$420 = 325+x$

$-325 \quad -325$

$\boxed{95 = x}$

63. A track team has 24 sprinters and 10 distance runners. How many additional distance runners would have to be added onto the team so that the team would have 40% distance runners?

x = additional distance runners

$\dfrac{distance\ runners}{total\ runners} = .4$

$\dfrac{10+x}{34+x} = \dfrac{.4}{1}$

$13.6+.4x = 10+x$

$-.4x \qquad -.4x$

$13.6 = 10+.6x$

$-10 \quad -10$

$\dfrac{3.6}{.6} = \dfrac{.6x}{.6}$

$6 = x$

64. The values of 11 houses on Washington St. are shown in the table below. State which measure of central tendency, the mean or the median, *best* represents the values of these 11 houses. Justify your answer. If the $700,000 house was removed, out of the range, mean, and median, which would be most affected? Which would be least affected?

Value per House	Number of Houses
$100,000	1
$175,000	5
$200,000	4
$700,000	1

Median, because there is an outlier

IF $700,000 removed, range most affected, then mean, then median.

65. Which survey is *least* likely to contain bias?

1) surveying a sample of people leaving a movie theater to determine which flavor of ice cream is the most popular

2) surveying the members of a football team to determine the most watched TV sport

3) surveying a sample of people leaving a library to determine the average number of books a person reads in a year

4) surveying a sample of people leaving a gym to determine the average number of hours a person exercises per week

66. A survey was conducted in a high school and it was found that 90% of the sample of students use SnapChat. Which of the following would be a valid conclusion to draw?

1) 90% of the students in the high school use SnapChat.

2) Approximately 27 students in a randomly chosen English class of 30 use SnapChat.

3) 9 out of the first 10 students that walk in the building in the morning use SnapChat.

4) Approximately 90% of SnapChat users are high school students.

$$\frac{27}{30}$$

67. Which of the following equations has no solution?

1) $|x+a|+4=3$

2) $|x-a|+2=3$

3) $|x+a|-5=-4$

4) $|x-a|+3=9$

$|x+a| = -1$

68. Solve for x:

$4|2x+3|-3=17$

$+3 \quad +3$

$$\frac{4|2x+3|}{4} = \frac{20}{4}$$

$|2x+3| = 5$

$2x+3=5$

$-3 \quad -3$

$$\frac{2x}{2} = \frac{2}{2}$$

$x=1$

$2x+3=-5$

$-3 \quad -3$

$$\frac{2x}{2} = \frac{-8}{2}$$

$x=-4$

69. Solve for x:

$2\sqrt{x+4}-3=7$

$+3 +3$

$$\frac{2\sqrt{x+4}}{2} = \frac{10}{2}$$

$(\sqrt{x+4})^2 = (5)^2$

$x+4 = 25$

$-4 \quad -4$

$x = 21$

70. Solve for x:

$27^x = 9^{x+2}$

$(3^3)^x = (3^2)^{x+2}$

$3^{3x} = 3^{2x+4}$

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

71. Solve for x:

$\sqrt{(4x-5)^2} = 9$

$4x - 5 = \pm 3$

$4x - 5 = 3$
$+5 \quad +5$
$\dfrac{4x}{4} = \dfrac{8}{4}$
$x = 2$

$4x - 5 = -3$
$+5 \quad +5$
$\dfrac{4x}{4} = \dfrac{2}{4}$
$x = \dfrac{1}{2}$

72. Rewrite $f(x) = x^2 + 6x + 2$ in vertex form and state the vertex $\left(\dfrac{b}{2}\right)^2$

$\quad -2 \qquad\qquad -2$

$f(x) - 2 = x^2 + 6x$

$f(x) - 2 + \boxed{9} = x^2 + 6x + \boxed{9}$

$f(x) + 7 = (x+3)(x+3)$

$f(x) + 7 = (x+3)^2$
$-7 \qquad\qquad -7$

$f(x) = (x+3)^2 - 7$

$\left(\dfrac{6}{2}\right)^2 = 9$

$(-3, -7)$

73. Find the center and radius of

$x^2 + 8y + 10 + y^2 - 4x = 6$
$\quad\quad\quad -10 \qquad\qquad -10$

$x^2 - 4x + y^2 + 8y = -4$

$x^2 - 4x + \boxed{4} + y^2 + 8y + \boxed{16} = -4 + \boxed{4} + \boxed{16}$

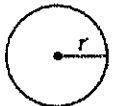$(x-2)(x-2) + (y+4)(y+4) = 16$

$\left(\dfrac{-4}{2}\right)^2 = 4$

$\left(\dfrac{8}{2}\right)^2 = 16$

$(x-2)^2 + (y+4)^2 = 16$

center: $(2, -4)$
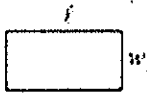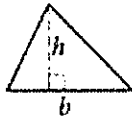
radius = 4

$A = \pi r^2$
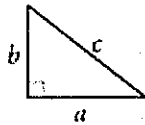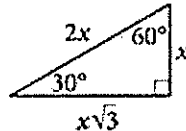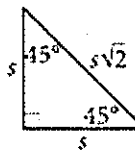$C = 2\pi r$

$A = \ell w$

$A = \dfrac{1}{2}bh$
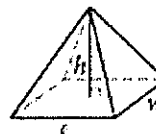
$c^2 = a^2 + b^2$

Special Right Triangles

$V = \ell w h$

$V = \pi r^2 h$

$V = \dfrac{4}{3}\pi r^3$

$V = \dfrac{1}{3}\pi r^2 h$

$V = \dfrac{1}{3}\ell w h$

The number of degrees of arc in a circle is 360.