29. In Intermediate Algebra class, Ms. Schimmack makes the statement "y varies directly as the product of w^2 and x, and inversely as z^3" and asks her students to translate it into an equation. Which of the following equations, with k as the constant of proportionality, is a correct translation of Ms. Schimmack's statement?

(A.) $y = \dfrac{kw^2x}{z^3}$

B. $y = \dfrac{kz^3}{w^2x}$

C. $y = \dfrac{w^2xz^3}{k}$

D. $y = \dfrac{z^3}{kw^2x}$

E. $y = kw^2xz^3$

36. Which of the following is an equation of the line that passes through the points $(1,3)$ and $(-3,-13)$ in the standard (x,y) coordinate plane?

F. $x + y = 4$
(G.) $4x - y = 1$
H. $5x - y = 2$
J. $6x - 2y = 8$
K. $7x - 2y = 5$

$y = 4x - 1$

$M = \dfrac{3 + 13}{1 + 3} = \dfrac{16}{4} = 4$

$3 = 4 + b \qquad b = -1$

38. If the following system has a solution, what is the x-coordinate of the solution?

$$3x + 6y = 52$$
$$-(x + 6y = 24)$$

F. 19
(G.) 14
H. 6
J. 0
K. The system has no solution.

$2x = 28$
$x = 14$

44. Consider the exponential equation $y = Ca^t$, where C and a are positive real constants and t is a positive real number. The value of y decreases as the value of t increases if and only if which of the following statements about a is true?

F. $-1 < a$
G. $0 < a$
(H.) $0 < a < 1$
J. $1 < a < 2$
K. $1 < a$

F doesn't work since even values of t make a positive.

45. What is the distance, in coordinate units, between the points $P(-2,-1)$ and $Q(1,3)$ in the standard (x,y) coordinate plane?

A. $\sqrt{5}$
B. $\sqrt{7}$
C. 3
(D.) 5
E. 7

$d = \sqrt{(y_2 - y_1)^2 + (x_2 - x_1)^2}$

$= \sqrt{(3 - -1)^2 + (1 - -2)^2}$

$= \sqrt{4^2 + 3^2}$

$= \sqrt{25}$

$= 5$

47. Which of the following defines the solution set for the system of inequalities below?

$$x \le 6$$
$$4 + 2x \ge 0$$

A. $x \ge -2$
B. $x \le 6$
C. $-8 \le x \le 6$
(D.) $-2 \le x \le 6$
E. $2 \le x \le 6$

$2x \ge -4$

$x \ge -2$

49. If two lines in the standard (x,y) coordinate plane are perpendicular and the slope of one of the lines is 3, what is the slope of the other line?

A. -3
B. -1
(C.) $-\frac{1}{3}$
D. $\frac{1}{3}$
E. 3

Opposite, reciprocal slopes

50. In the standard (x,y) coordinate plane, $(12,3)$ is half-way between $(2a, a + 3)$ and $(4a, a - 5)$. What is the value of a?

F. 0
G. 2
H. 3
(J.) 4
K. 6

$\dfrac{2a + 4a}{2} = 12$

$6a = 24$
$a = 4$

$\dfrac{6a}{2} = 12$
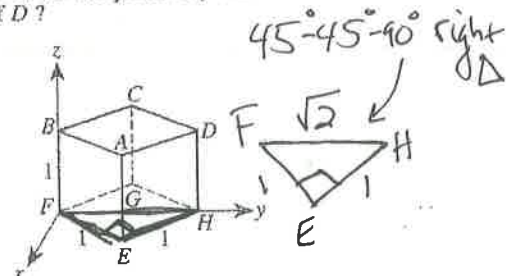
51. How many 3-letter orderings, where no letter is repeated, can be made using the letters of the word GATORS?

A. 3
B. 6
C. 27
(D.) 120
E. 216

$6 \cdot 5 \cdot 4$

$30 \cdot 4 = 120$

52. As shown in the (x,y,z) coordinate space below, the cube with vertices A through H has edges that are 1 coordinate unit long. The coordinates of F are $(0,0,0)$, and H is on the positive y-axis. What are the coordinates of D?

45-45-90 right $\triangle$.

F. $(0,1,1)$
G. $(0,\sqrt{2},0)$
(H.) $(0,\sqrt{2},1)$
J. $(0,\sqrt{2},\sqrt{3})$
K. $(1,1,1)$

Did not come "out" (toward us) from the origin.

Not covered until Unit 8

53. Whenever x, y; and z are positive real numbers, which of the following expressions is equivalent to $2 \log_3 x + \frac{1}{2} \log_6 y - \log_3 z$? **Diff. bases**

$\log_3 \frac{x^2}{z} + \log_6 \sqrt{y}$

A. $\log_3\left(\frac{x^2 y}{z}\right)$

B. $\log_3\left(\frac{x^2}{z}\right) + \log_6(\sqrt{y})$ ⟵ (circled)

C. $\log_3\left(\frac{z}{x^2}\right) + \log_6\left(\frac{y}{2}\right)$

D. $\log_3(x - z) + \log_6(\sqrt{y})$

E. $2\log_3(x - z) + \log_6\left(\frac{y}{2}\right)$

54. If $2 \le x \le 5$ and $-4 \le y \le -3$, what is the maximum value of $|y - 2x|$?

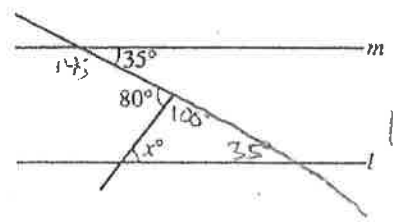F. 20
G. 14 ⟵ (circled)
H. 13
J. 8
K. 7

$|-4 - 2(5)|$
$= |-14| = 14$

57. Which of the following is an equivalent expression for r in terms of S and t whenever r, S, and t are all distinct and $S = \frac{rt - 3}{r - t}$?

A. $\frac{St - 3}{S - t}$ ⟵ (circled)

B. $\frac{S - 3}{S - 1}$

C. $\frac{S - t}{S - 3}$

D. $\frac{St - 3}{S + t}$

E. $\frac{3}{t - S}$

$(r - t) \cdot S = rt - 3$
$Sr - St = rt - 3$
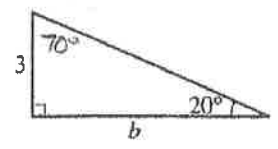$Sr - rt = St - 3$
$r(S - t) = St - 3$
$r = \frac{St - 3}{S - t}$

58. In the figure below, lines l and m are parallel and angle measures are as marked. If it can be determined, what is the value of x ?

$180 - 135 =$

F. 35
G. 45 ⟵ (circled)
H. 65
J. 80
K. Cannot be determined from the given information

59. In the triangle below, where the 2 given side lengths are expressed in feet, what is the value of b ?

A. $3 \cos 20°$
B. $3 \sin 20°$
C. $3 \tan 20°$
D. $3 \sin 70°$
E. $3 \tan 70°$ ⟵ (circled)

$\tan 20° = \frac{3}{b}$

or $\tan 70° = \frac{b}{3}$ $b = 3 \tan 70°$

60. An angle in standard position in the standard (x, y) coordinate plane has its vertex at the origin and its initial side on the positive x-axis. If the measure of an angle in standard position is $1,573°$, it has the same terminal side as an angle of each of the following measures EXCEPT:

F. $-587°$
G. $-227°$
H. $133°$
J. $493°$
K. $573°$ ⟵ (circled)