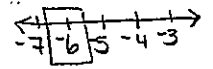


Algebra 1 CC - Midterm Review

$$\begin{array}{r} \textcircled{1} \quad 8x - 5 = 5x + 22 \\ -5x \quad -5x \\ \hline 3x - 5 = 22 \\ +5 \quad +5 \\ \hline 3x = 27 \\ \frac{3x}{3} = \frac{27}{3} \\ \boxed{x = 9} \end{array}$$

$$\begin{array}{r} \textcircled{2} \quad (2f^2 + 5f - 1) - (4f^2 - 3f + 2) \\ (2f^2 + 5f - 1) + (-4f^2 + 3f - 2) \\ \hline \boxed{-2f^2 + 8f - 3} \end{array}$$

$$\begin{array}{r} \textcircled{3} \quad -3x + 7 > 22 \\ -7 \quad -7 \\ \hline -3x > 15 \\ -3 \quad -3 \\ \hline x < -5 \\ \boxed{\text{Largest} = -6} \end{array}$$



$$\begin{array}{r} \textcircled{4} \quad 3x - 2y = 7 \quad (x, y) \\ \quad \quad \quad \quad \quad \quad \quad (k, 4) \\ 3(k) - 2(4) = 7 \\ 3k - 8 = 7 \\ +8 \quad +8 \\ \hline 3k = 15 \\ \frac{3k}{3} = \frac{15}{3} \\ \boxed{k = 5} \end{array}$$

Total cost
↓
#times you ride ski lift

$$\textcircled{5} \quad C(n) = 1.25n + 9$$

↑ ↑
cost for ski lift cost for tube rental
ride

Choice 3

$$\begin{array}{r} \textcircled{6} \quad \text{Solve for } x: \\ 4dx + e = f \\ -e \quad -e \\ \hline 4dx = f - e \\ \frac{4dx}{4d} = \frac{f - e}{4d} \\ \boxed{x = \frac{f - e}{4d}} \end{array}$$

$$\begin{array}{r} \text{Solve for } d: \\ 4dx + e = f \\ -e \quad -e \\ \hline 4dx = f - e \\ \frac{4dx}{4x} = \frac{f - e}{4x} \\ \boxed{d = \frac{f - e}{4x}} \end{array}$$

$$\begin{array}{r} \text{Solve for } e: \\ 4dx + e = f \\ -4dx \quad -4dx \\ \hline \boxed{e = f - 4dx} \end{array}$$

$\textcircled{7}$ Four more than 7 times a # is less than seventeen.

$7m + 4 < 17$

$\textcircled{8}$ $3.13, \frac{23}{7}, \pi, \sqrt{9.3}$

Largest → smallest

$\frac{23}{7}, \pi, 3.13, \sqrt{9.3}$

$\frac{23}{7} = 3.2857$

$\pi = 3.1415$

$\sqrt{9.3} = 3.0495$

$\textcircled{9}$ (a) NO, repeating x-values
(b) NO, repeating x-values

(c) YES, no repeating x-values
(d) YES, no repeating x-values

⑩ product \rightarrow multiply
 $-2xy^2(3x^2y + xy^2)$
 $-6x^3y^3 - 2x^2y^4$

(Multiply Coefficients/ Add exponents)

⑪ $4x - 7 + 2x = 5x + 9$
 $6x - 7 = 5x + 9$
 $\frac{-5x \quad -5x}{x - 7 = 9}$
 $\frac{+7 \quad +7}{x = 16}$

⑫ Functions must pass the vertical line test.

⑬ Slope Formula:
 $m = \frac{y_2 - y_1}{x_2 - x_1}$ $(2, -5)$ & $(3, -7)$
 (x_1, y_1) (x_2, y_2)

$m = \frac{-7 - (-5)}{3 - 2} = \frac{-2}{1} = -2$

$\boxed{\text{Slope} = -2}$

⑭ $12[4 + 5^2(3 + 2) - 14] + 6$
 P \rightarrow parenthesis
 E
 MD
 AS
 $\boxed{\text{Add } 3+2}$

⑮ $f(x) = x^2 + 4x$
 $f(-3) = (-3)^2 + 4(-3)$
 $f(-3) = 9 - 12$
 $\boxed{f(-3) = -3}$

⑯ Expression \rightarrow NO equal sign

Equation \rightarrow has an equal sign

⑰ $y \leq 2x - 1$ $y > -x + 3$

~~(3, 0)~~ $0 \leq 2(3) - 1$ $0 > -(3) + 3$
 $0 \leq 5 \checkmark$ $0 > 0 \times$

$\boxed{(5, 3)}$ $3 \leq 2(5) - 1$ $3 > -(5) + 3$
 $3 \leq 9 \checkmark$ $3 > -2 \checkmark$

~~(0, 4)~~ $7 \leq 2(0) - 1$ \times
 $7 \leq -1$

~~(-5, 2)~~ $-2 \leq 2(-5) - 1$ \times
 $-2 \leq -11$

⑱ one-third of $3^5 \rightarrow \frac{1}{3}(3^5) = \boxed{81}$

one fourth of $4^7 \rightarrow \frac{1}{4}(4^7) = \boxed{4096}$

one fifth of $5^3 \rightarrow \frac{1}{5}(5^3) = \boxed{25}$

- (19) Associative Property $\rightarrow a(bc) = (ab)c$
 Distributive Property $\rightarrow a(b+c) = ab+ac$
 Commutative Property $\rightarrow a+b = b+a$
 Additive Prop. of equality $\rightarrow a+0=a$
 Multiplicative Prop. of eq. $\rightarrow a \cdot 1 = a$

- (20) Linear function
 Step function
 Absolute Value function
 Piecewise function

(21)
$$\begin{array}{r} -3x - 4y = 5 \\ +3x \quad +3x \\ \hline -4y = 3x + 5 \\ \frac{-4}{-4} \quad \frac{3x}{-4} \quad \frac{5}{-4} \\ y = -\frac{3}{4}x - \frac{5}{4} \end{array}$$

(A) slope = $-\frac{3}{4}$ ✓

(B) Slope = $-\frac{3}{4}x$

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

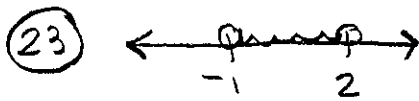
(d) $-3(4) - 4(1) = 5$
 $-12 - 4 = 5$
 $-16 = 5x$

(22) $15x^6 + 5x^4 + 30x^3$
 $5x^3$

$\frac{15x^6}{5x^3} - \frac{5x^4}{5x^3} + \frac{30x^3}{5x^3}$

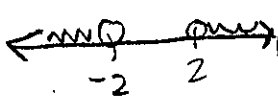
$3x^3 - x + 6$

(Divide Coefficients and Subtract exponents)

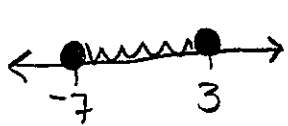


Inequality Notation
 $-1 < x < 2$

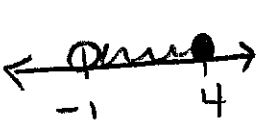
Interval Notation
 $(-1, 2)$



$x < -2$ OR $x > 2$ $(-\infty, -2)$ OR $(2, \infty)$



$-7 \leq x \leq 3$ $[-7, 3]$



$-1 < x \leq 4$ $(-1, 4]$

(24) $-4(x+3) \geq -28$
 $-4x - 12 \geq -28$
 $\quad +12 \quad +12$
 $\hline -4x \geq -16$
 $\quad -4 \quad -4$
 $\hline x \leq 4$

(25) (1) $\frac{3x}{3} = \frac{9}{3}$ Equation
 $x = 3$

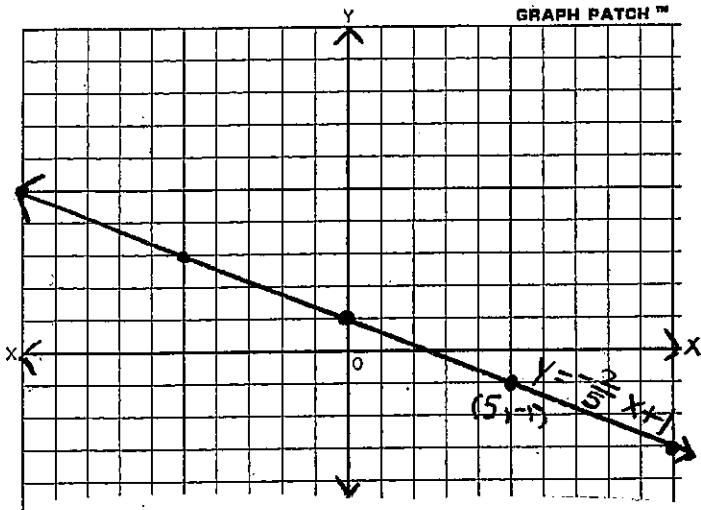
(2) $2x - 7 + 5y$ Expression

(3) $3(x-4) + 2 = 11$ Equation
 $3x - 12 + 2 = 11$
 $3x - 10 = 11$
 $3x = 21$
 $x = 7$

(4) $5x + 7 = 3x - 5$ Equation
 $2x = 12$
 $x = 6$

(5) $3x^3 - 2x + 5 - 2x^2$ Expression

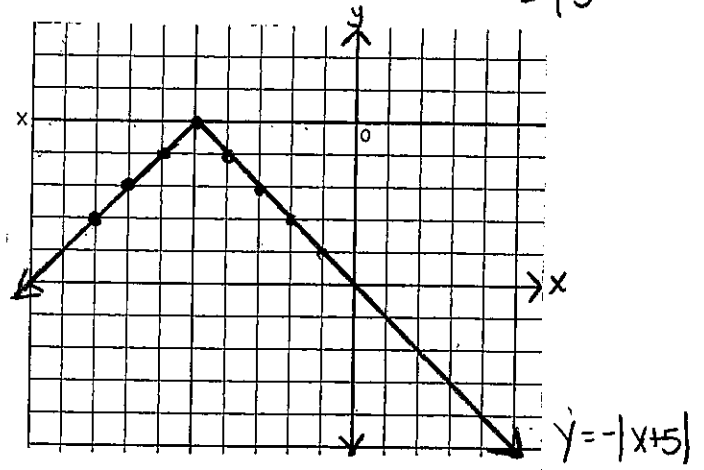
(26) $y = -\frac{2}{5}x + 1$ $m = -\frac{2}{5} \xrightarrow{\downarrow 2} \frac{2}{5}$
 $b = 1$



Yes, (5, -1) is a solution because it falls on the graphed line.

(27) $y = -|x+5|$
 Absolute Value makes a V.

| x | y |
|----|----|
| -8 | -3 |
| -7 | -2 |
| -6 | -1 |
| -5 | 0 |
| -4 | -1 |
| -3 | -2 |
| -2 | -3 |



Increasing: $(-\infty, 5)$
 $-\infty < x < 5$

(28) Domain $-4 \leq x \leq 4$
 Range $0 \leq y \leq 4$

(29) Average Rate of Change

| x | y |
|---|------|
| 0 | 93.5 |
| 2 | 5.84 |

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{5.84 - 93.5}{2 - 0} = \frac{-88.02}{2} = \boxed{-44.0}$$

(30) Step function
 It costs \$10/hour

(31) $3x + bx + 4 < 2$ ($x = -2$)
 $3(-2) + b(-2) + 4 < 2$
 $-6 - 2b + 4 < 2$
 $-2b - 2 < 2$
 $-2b < 4$
 $|b > -2$

$\boxed{\text{smallest} = -3}$

(32) $m(x) = (2x-1)(4-x) + 3x^2 + 17$
 $m(x) = \boxed{8x} - \boxed{2x^2} - \boxed{4} + \boxed{x} + \boxed{3x^2} + \boxed{17}$
 $m(x) = \boxed{x^2 + 9x + 13}$

$m(-3) = (-3)^2 + 9(-3) + 13$

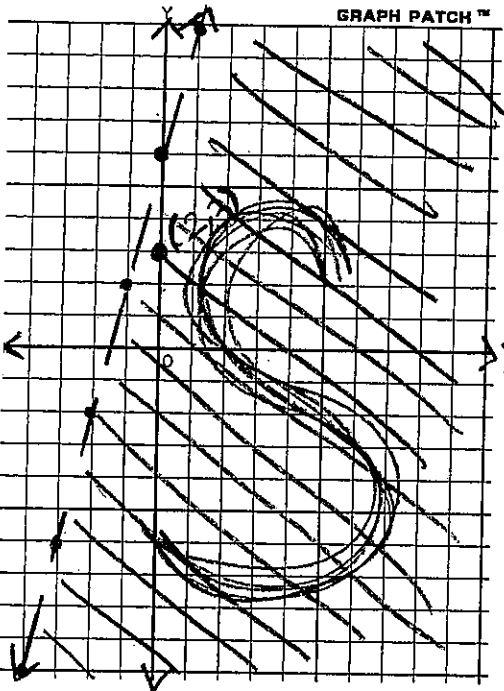
$\boxed{m(-3) = -5}$

$$\textcircled{33} \quad \begin{array}{r} 2y - 5 < 8x + 7 \\ +5 \qquad +5 \end{array}$$

$$\frac{2y}{2} < \frac{8x}{2} + \frac{12}{2}$$

$$y < 4x + 6 \quad m=4 \quad b=6$$

Shade below & Dashed line

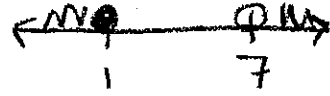


Yes (2,3) is a solution to the inequality because it falls within the shaded area.

$$\textcircled{34} \quad \begin{array}{r} -3d + 2z - 1 \\ -3d \geq -3 \end{array} \quad \begin{array}{r} 5d - 22 > 13 \\ 5d > 35 \end{array}$$

$$d \leq 1 \quad \text{OR} \quad d > 7$$

$$(-\infty, 1] \quad \text{OR} \quad (7, \infty)$$



$$\textcircled{35} \quad 75 - 100 \rightarrow \text{Stock values are decreasing}$$

$$300 - 400 \rightarrow \text{Stock values are increasing}$$

$$125 - 200 \rightarrow \text{Stock values are increasing}$$

$$\textcircled{37} \quad \text{(a) } (7, 12) \text{ and } (10, 18)$$

$$\text{(b) } m = \frac{18 - 12}{10 - 7} = \frac{6}{3} = \boxed{2}$$

$$\text{(c) } r = mt + b$$

$$12 = 2(7) + b$$

$$12 = 14 + b$$

$$-2 = b$$

$$\boxed{r = 2t - 2}$$

$$\text{(d) } r = 2t - 2$$

$$r = 2(60) - 2$$

$$r = 120 - 2$$

$$\boxed{r = 118}$$

$$\text{(e) } \begin{array}{r} r = 2t - 2 \\ 200 = 2t - 2 \\ 202 = 2t \\ \frac{202}{2} = \frac{2t}{2} \end{array}$$

$$\boxed{t = 10 \text{ minutes}}$$

$$\textcircled{36} \quad f(x) = \begin{cases} -x + 1 & -4 \leq x \leq -1 \\ 2 & -1 \leq x \leq 3 \\ 2x - 4 & 3 \leq x \leq 7 \end{cases}$$

$$y = -x + 1$$

| x | y |
|----|---|
| -4 | 5 |
| -3 | 4 |
| -2 | 3 |
| -1 | 2 |

$$y = 2$$

| x | y |
|----|---|
| -1 | 2 |
| 0 | 2 |
| 1 | 2 |
| 2 | 2 |
| 3 | 2 |

$$y = 2x - 4$$

| x | y |
|---|----|
| 3 | 2 |
| 4 | 4 |
| 5 | 6 |
| 6 | 8 |
| 7 | 10 |

