HSES Math Placement Exam REVIEW MATERIALS

Name: KEY Student ID#: _____ Date: _____

CLEARLY write your answer to each question below. You will only get credit for answers on this sheet, not for anything written in your test book.

1. 52	19. $16z - 1$	37. $5\sqrt{3}$
2. $1/12$	20. \$230.25	38. $(x+3)(x+4)$
3. $\sqrt{3}$	21. \$174	39. $2x^2+3x-35$
4. 24	22. 3.2 hours. or 3 hrs 12 min	40. $x = -1, -2/3$
5. $13/21$	23. \$1.35	41. x^3y^2
6. 63	24. 13 in	42. $3a^2b$
7. 3	25. $x = 6$	43. $18a^2b^3$
8. 7.85×10^{-4}	26. $x = 3$	44. $3a^2b - 8ab^2 + a^2b^2$
9. 12	27. $x = 0$	45. $\frac{x}{4+7x}$
10. (0, 6)	28. -1	
11. $5/4$	29. (NEED ENTIRE ANS) $x \leq -8$ OR $x > 0$	
12. 63, 64, or 65	30. -22	
13. weak negative	31. $x > -6$	
14. 50	32. $y = \frac{2}{5}x + 8$	
15. 24%	33. (2, 5) or $y = 5$, $x = 2$	
16. Mean = 8, Median = 7	34. $y = -2x$ (or equivalent)	
17. 90	35. $y \geq -3x + 4$	
18. 40.7% OR 41%	36. $y = 5x + 24$	

INSTRUCTIONS!

Questions 1 – 27 will be used to place you in the proper level of Algebra I class. If you have not had Algebra I yet, concentrate on these questions.

Questions 28 – 45 will be used to determine whether or not you will "test out" of Algebra I and go to Geometry as a freshman. Do these after you complete #1-27.

OFFICIAL USE ONLY (Do not write here)

SECTION	1	2	3	4	5	PA	A1	TOTAL
# CORRECT								
PLACEMENT								

Sections 1-3 (PA) are required for all students and sections 4-5 (A1) are optional but are encouraged for students that have taken Algebra I.

HSES placement test review

(1) $20 \div 2(6+-1) - (6-8)$

$20 \div 2(5) - (-2)$

$10(5) + 2$

$50 + 2$

$= \boxed{52}$

P
no exponents (E)
MD (work left to right)
AS (work left to right)

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(2) $\dfrac{\frac{2}{9}}{\frac{8}{3}} = \dfrac{2}{9} \cdot \dfrac{3}{8} = \dfrac{6}{72} = \boxed{\frac{1}{12}}$

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(3) $2.1 = 2.1$

$\sqrt{3} \approx 1.7$

$11/10 = 1.1$

$(1.2)^2 = 1.44$

$-1.25 = -1.25$

So, largest to smallest:

$2.1, \boxed{\sqrt{3}}, 1.44, 1.1, -1.25$

↑ ANS

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(4) $\frac{1}{6}$ (↖ 2·3) and $\frac{5}{8}$ (↖ 2·4)

So least common denominator is $2 \cdot 3 \cdot 4 = \boxed{24}$ (the LCM of 6 and 8)

(5) $\frac{1}{3} + \frac{2}{7} = \frac{1}{3}\left(\frac{7}{7}\right) + \frac{2}{7}\left(\frac{3}{3}\right)$

$= \frac{7}{21} + \frac{6}{21} = \boxed{\frac{13}{21}}$

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(6) $9 = 3 \cdot 3$, $21 = 3 \cdot 7$

thus LCM of 9 and 21 is

$3 \cdot 3 \cdot 7 = \boxed{63}$

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(7) $9 = 3 \cdot 3$, $21 = 3 \cdot 7$

GCF of 9 and 21 is $\boxed{3}$

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(8) $.000785$

moved decimal 4 spaces left (-)

$\boxed{7.85 \times 10^{-4}}$

IN scientific notation is between 1 and 10 (including 1, not 10)

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(9) $\frac{(1-7)^2}{5-2} = \frac{(-6)^2}{3} = \frac{36}{3} = \boxed{12}$

P (parentheses) E (exponent) D (Div/mult)

(10) Point B has y-coordinate of 6 and x-coordinate of 0, so B is at $\boxed{(0,6)}$

(11) the origin is at (0,0)
point A is at (4,5)

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{5-0}{4-0} = \boxed{5/4}$$

(12) the x-axis of the graph starts at x=20 (BMI) so the y-value you want is the y-intercept on the graph (it's not actually the y-int, because that's when x=0, not 20... but on this picture, the axis is @ x=20) so $\boxed{64 \text{ or } 65}$ ← both are close enough

(13) the graph has a weak (not tightly packed around the best fit line) negative (best fit line has a negative slope) correlation

$\boxed{\text{WEAK NEGATIVE}}$

(14) ADD up All of the Students
$21 + 7 + 10 + 12 = \boxed{50}$

(15) you want $\frac{\#\text{juniors}}{\text{total }\#} = \frac{12}{50}$

$= .24$ so **24%**

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(16) 5, 6, 8, 16, 9, 5, 7

put DATA IN ASCending order:

5, 5, 6, (7) 8, 9, 16

↑

MEDIAN IS 7

$\text{MEAN} = \frac{\text{sum of all entries}}{\text{\# of entries}}$

$= \frac{6+5+6+7+8+9+16}{7}$

$= 56/7 = 8 \leftarrow$ MEAN

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(17) $500(.18) = 90$

or $500 \cdot \frac{18}{100} = 5 \cdot 18 = 90$

OR $\frac{x}{500} = \frac{18}{100}$ $\quad x = \frac{500}{100} \cdot 18 = 90$

$100x = 500 \cdot 18$

(18) 112 is what percentage of 275

$\frac{112}{275} \approx .407$ so **41%** or **40.7%**

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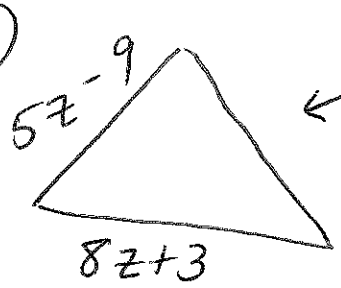
(19)



missing side is $3z+5$

perimeter = sum of the sides

$P = 5z-9+8z+3+3z+5$ ← combine like terms

$= \boxed{16z-1}$

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(20) 25% off means you pay 75%

so $(.75)(307) = \boxed{\$230.25}$

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(21) $5(18) + 4(21) = 90+84$

(# shirts) (cost of shirt) (# pants) (cost of pants)

$= \boxed{\$174}$

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(22) $160 \text{ miles} \cdot \frac{1 \text{ hr}}{50 \text{ miles}} = \frac{160}{50}$ hrs

$= \boxed{3.2 \text{ hours}}$

or **3 hours and 12 min** ← b/c .2hr. $\frac{60 \text{ min}}{1 \text{ hr}} = 12$

(23) So she spent $20 - 7.85 = 12.15$ on 9 notebooks

$\frac{12.15}{9} = \boxed{\$1.35}$ per notebook

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(24) 1 INCH = 50 FT

$650\text{FT} \cdot \frac{1\text{ IN}}{50\text{FT}} = \boxed{13\text{ IN}}$

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(25) $4x - 7 = 17$

$+7 \quad +7$

$\frac{4x}{4} = \frac{24}{4}$

$\boxed{x = 6}$

SA DM

solve w/ SADMEP (PEMDAS backwards)

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(26) $8x - 3(x+1) = 12$

$8x - 3x - 3 = 12$

Combine like terms

$5x - 3 = 12$

$+3 \quad +3$

$\frac{5x}{5} = \frac{15}{5}$

$\boxed{x = 3}$

solve by SADMEP

SA

DM

(27) $10 - 7x = 5(x+2)$

$10 - 7x = 5x + 10$

$-5x \quad -5x$

move all x's to one side

$10 - 12x = 10$

$-10 \quad -10$

move all constants to other side

$-12x = 0$

Divide

$\frac{-12}{-12} \quad \frac{0}{-12}$

$\boxed{x = 0}$

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this is the end of the PRE-Algebra sections.

the next two sections contain Algebra I content.

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(28) pick two points on the line

(0, 3) and (3, 0)

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{0-3}{3-0} = \frac{-3}{3} = \boxed{-1}$

OR count the blocks

$m = \frac{\text{rise}}{\text{run}} = \frac{-3 \text{ (down 3)}}{3 \text{ (right 3)}} = -1$

(29)

$x \leq -8$ OR $x > 0$

↑ EQUAL TO b/c OF SOLID DOT

↑ because IT'S TWO Separate intervals

↑ not EQUAL to b/c OF open DOT

NOTE: IT IS NOT

$0 < x \leq -8$ b/c can't take out x and get a true ANS

$0 \leq -8$ lie!!

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(30) $f(x) = 5x - 7$

$f(-3) = 5(-3) - 7 = -15 - 7$

$= \boxed{-22}$

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(31) $4x < 9x + 30$

$-9x \quad -9x$

$\frac{-5x}{-5} < \frac{30}{-5}$

$\boxed{x > -6}$

(32) $2x+5y=40$

$\frac{5y}{5} = \frac{2x}{5} + \frac{40}{5}$

$\boxed{y=\frac{2}{5}x+8}$ ← slope intercept form

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(33) $(2x+y=9)3 \rightarrow 6x+3y=27$

$3x-3y=-9 \quad 3x-3y=-9$

$9x+0=18$

$9x=18$

$\boxed{x=2}$

$2x+y=9$

$2(2)+y=9$

$4+y=9$

$\boxed{y=5}$

ANS: $\boxed{(2,5)}$

or $\boxed{x=2, y=5}$

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(34) $(-1,2) \quad (2,-4)$

$m=\frac{-4-2}{2-(-1)}=\frac{-6}{3}=-2$

$y=mx+b$

use $(-1,2)$

$2=-2(-1)+b$

$2=2+b \quad b=0$

ANS: $\boxed{y=-2x+0}$ or $\boxed{y=-2x}$

or in point-slope form

$\boxed{y-2=-2(x+1)}$ or $\boxed{y+4=-2(x-2)}$

ANY of these four ANSWERS is CORRECT

(35) FIRST FIND the EQUATION USING TWO POINTS on the line
I PICKED (0,4) and (1,1)

↑ the y-INT

$$m = \frac{1-4}{1-0} = \frac{-3}{1} = -3$$

$$y = mx + b$$

$$y = -3x + 4$$

↑ slope ↑ y-INT

but IT's AN INEQUALITY with
① A solid line (so it's "EQUAL TO")
and
② IT's shaded ABOVE the line
(so y is greater than)

thus $\boxed{y \geq -3x + 4}$

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(36) the y-INTercept is @ y=24, so
THAT rules out A and D.
to find the slope, note that the
scales on the two axes are DIFFERENT
(so you can't just count the boxes)
use two points (0,24) and
(8,64)

$$m = \frac{64-24}{8-0} = \frac{40}{8} = 5$$

B

$\boxed{y = 5x + 24}$

(37) $\sqrt{75} = \sqrt{25 \cdot 3} = \sqrt{25} \cdot \sqrt{3}$

$= \boxed{5\sqrt{3}}$

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(38) $x^2 + 7x + 12$

UN-FOIL

same sign

$x^2 + 7x + 12$

F O+I I

$x \cdot x$

3, 4

1, 12

2, 6

$\boxed{(x+3)(x+4)}$

FOIL to check

$(x+3)(x+4)$

F + O + I + L

$x \cdot x + 4 \cdot x + 3x + 3 \cdot 4$

$x^2 + 7x + 12$ ✓

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(39) $(x+5)(2x-7)$ FOIL

F O I L

$2x \cdot x + -7 \cdot x + 5 \cdot 2x + 5(-7)$

$= 2x^2 - 7x + 10x - 35$

$= \boxed{2x^2 + 3x - 35}$

(40) $3x^2+5x+2=0$

UNFOIL (like in #38)

$3x^2 + 5x + 2 = 0$

$3x \cdot x$; $1 \cdot 2$ ↑ same sign

$(3x+2)(x+1)$ ← FOIL to check

$3x^2+3x+2x+2$

$=3x^2+5x+2$ ✓

$(3x+2)(x+1)=0$

$3x+2=0$ $\quad x+1=0$

$3x=-2$ $\quad \boxed{x=-1}$

$\boxed{x=-2/3}$

↖ BOTH ANS REQUIRED

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(41) $\dfrac{x^5y^3}{x^2y} = x^{5-2}y^{3-1} = \boxed{x^3y^2}$

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(42) $15a^3b^2$ AND $24a^2b$

$3 \cdot 5 \cdot a \cdot a \cdot a \cdot b \cdot b$ AND $3 \cdot 2 \cdot 4 \cdot a \cdot a \cdot b$

GCF is $3 \cdot a \cdot a \cdot b = \boxed{3a^2b}$

(43) $6ab^3$ AND $9a^2b$

$\downarrow$ $\downarrow$

$2 \cdot 3 \cdot a \cdot b \cdot b \cdot b$ AND $3 \cdot 3 \cdot a \cdot a \cdot b$

so LCM needs...

$2 \cdot 3 \cdot 3 \cdot a \cdot a \cdot b \cdot b \cdot b$

$= \boxed{18a^2b^3}$

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(44) $ab(3a - 8b + ab)$

$3a \cdot ab - 8b \cdot ab + ab \cdot ab$

$= \boxed{3a^2b - 8ab^2 + a^2b^2}$

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(45) $\dfrac{3x^2}{12x + 21x^2} = \dfrac{3x^2}{3x(4 + 7x)}$

$= \boxed{\dfrac{x}{4 + 7x}}$