Key 2017 – Practice Test 2

1. $4(x-2) = 2(3x-1)$

$4x - 8 = 6x - 2$

$-4x \qquad -4x$

$-8 = 6x - 4x - 2$

$+2 \qquad +2$

$-8+2 = 2x$

$\frac{-6}{2} = \frac{2x}{2}$

$\boxed{-3 = x}$

[redacted] = □□□

2

2. $2(x+5) = 5$

this means $x+5 = \frac{5}{2}$ because $2\left(\frac{5}{2}\right) = 5$

$2x + 10 = 5$

$-10 \qquad -10$

$2x = +5 - 10 \rightarrow \frac{2x}{2} = -\frac{5}{2} \rightarrow x = -\frac{5}{2}$

B

Numerical Response

3. $\frac{16}{x} = 4 \Rightarrow \frac{16}{x}(x) = 4(x)$

$\frac{16}{4} = \frac{4x}{4} \Rightarrow \frac{16}{4} = x \Rightarrow 4 = x$

Prove: $\frac{16}{4} = 4$

$4 = 4$ ✓

4. 0, 2, −6 −10

$-3 < x + 2$

• try each → (0) $-3 < 0 + 2$

$-3 < 2$ TRUE

(2) $-3 < 2 + 2$

$-3 < 4$ TRUE

(−6) $-3 < -6 + 2$

$-3 < -4$ NOT TRUE

(−10) $-3 < -10 + 2$

$-3 < -8$ NOT TRUE

all negatives are smaller than positives

0 and 2 are solutions

A

(5)
- • means also "equal to"
- ∘ -4 means -4 can be a solution
- ∘ $\longrightarrow$ means greater

so $-4 \leq x$

Remember that when you divide or multiply by a (−) number, YOU MUST REVERSE the sign of the inequality

A. $-5x + 6 \geq 26$
$\quad -6 \quad -6$
$-5x \geq 20$
$\quad -5 \quad -5$
$x \leq -4$
Not the Solution

(13) $-5x + 6 \leq 26$
$\quad -6 \quad -6$
$-5x \leq 20$
$\quad -5 \quad -5$
$x \geq -4$ Solution

B

C. $-5x + 6 \geq -26$
$\quad -6 \quad -6$
$-5x \geq -32$
$\quad -5 \quad -5$
$x \leq 6.4$
Not the Solution

D. $-5x + 6 \leq -26$
$\quad -6 \quad -6$
$-5x \leq -32$
$\quad -5 \quad -5$
$x \geq 6.4$
Not the Solution

Numerical Response

(6) $\dfrac{79 + 86 + 83 + 77 + ?}{5} = 80\%$

$\dfrac{325 + ?}{5} = 80$ (5) Solve for ? $\quad 325 + ? = 400$
$\quad -325 \quad -325$

$? = 400 - 325$

$? = 75$

(7) $5x - y - 1$ - Coefficients are the numbers with the variables

$5x - 1y - 1$ → constant

D

5 and −1

(8) $x^2 - 4 = 21$
↓
"the square of a number"

C

- Not A
- Not B (x^2 is not number times two)
- C → a number times itself minus four equals 20 → $x^2 = x \cdot x$

9. $(9s - 3r + t) - \underbrace{(s - r - t)}_{\text{opposite}}$ to SUBTRACT ADD the OPPOSITE

$\downarrow$

$(9s - 3r + t) + (-s + r + t)$

$9s - 3r + t - s + r + t$ (Pair like terms)

$\underbrace{9s - s}, -3r + r + t + t$

$8s - 2r + 2t$ C

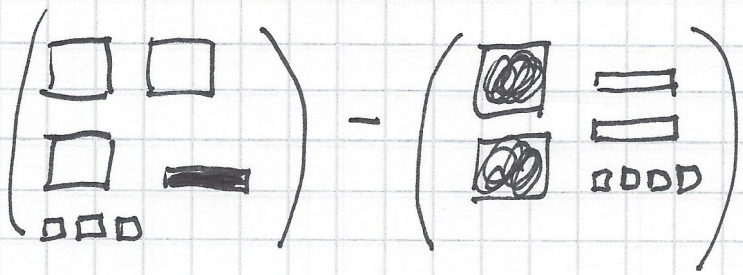
10. Simplifying means pairing like terms!

$(3x^2 - 4xy + 2yz) + (4xy + 5yz - 2x^2)$
$+ (x^2 - 5xy - 3yz + x$

Write vertically — Re-write so that "like terms" are on top of one another

$$\begin{array}{rrrr} 3x^2 & -4xy & +2yz & \\ -2x^2 & +4xy & +5yz & \text{(Re-arranged)} \\ x^2 & -5xy & -3yz & +x \\ \hline 2x^2 & -5xy & +4yz & +x \end{array}$$

C Answer: $2x^2 - 5xy + 4yz + x$

11. 

ADD the opposite

$\downarrow$

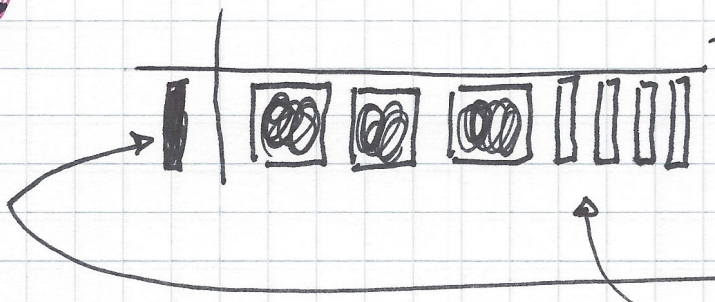
$(-3x^2 + x - 3) + (-2x^2 + 2x + 4)$

Re arrange:

$$\begin{array}{rrrr} -3x^2 & +x & -3 & + \\ -2x^2 & +2x & +4 & \\ \hline -5x^2 & +3x & +1 & \end{array}$$

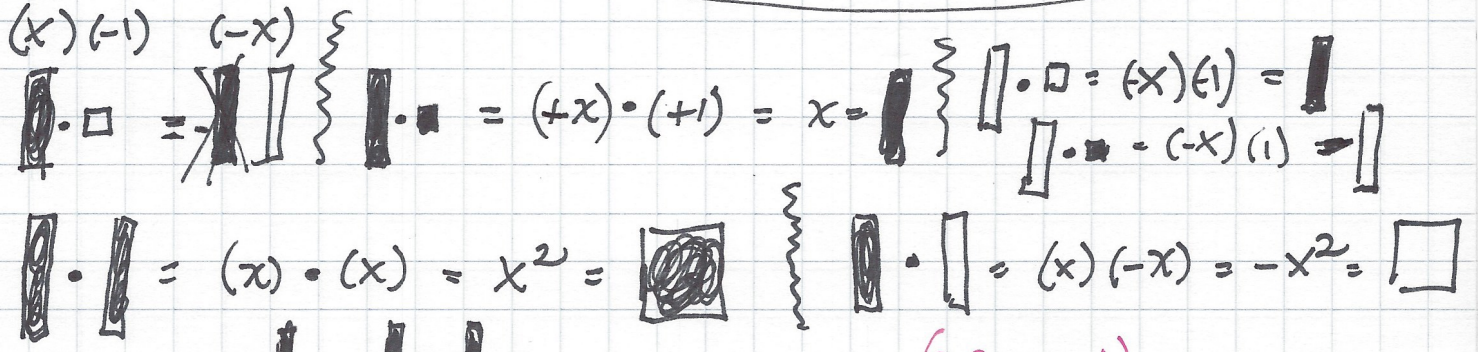
B

12



Here, you write the polynomial that multiplied with this, gives this

$(x)(-1)$ $(-x)$

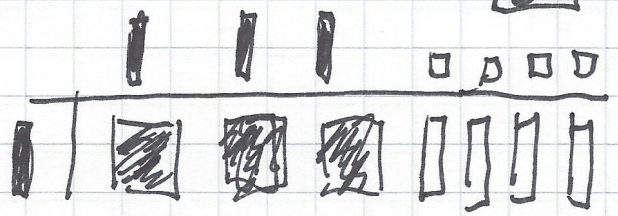


$= (+x)\cdot(+1) = x =$

$(-x)(1) =$

$(x)\cdot(x) = x^2 =$

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



$\rightarrow (3x-4)$

$(x)(3x+(-4)) \Rightarrow (x)(3x-4)$

$3x^2-4x$

OR try doing it numerically

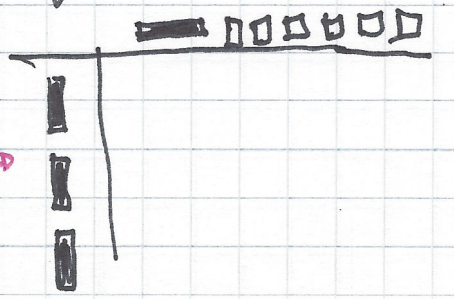
$(x)\cdot(3x-4) = 3x^2-4x$

x to $3x^2 \rightarrow (3x)(x) = 3x^{1+1}$

From x to $-4x \rightarrow (-4)(x) = -4x$

13 $3x(x-6) = (3x\cdot x) - (3x)(6)$

$(3x^{1+1}) - 18x = 3x^2 - 18x$



$\rightarrow x-6$

$3x \rightarrow$

Numerical Response

(14) $\dfrac{9n^4 + 36n^3 + 15n^2 + 21n}{3n}$

Law of Exponent

$= \dfrac{9n^4}{3n} + \dfrac{36n^3}{3n} + \dfrac{15n^2}{3n} + \dfrac{21n}{3n}$

$= 3n^{4-1} + 12n^{3-1} + 5n^{2-1} + 7n^{1-1}$

$= 3n^3 + 12n^2 + 5n^1 + 7(\cancel{n^0})$ $\quad n^0 = 1$

$\cdot 1$

$= 3n^3 + 12n^2 + 5n + 7$

Expand →

$\dfrac{9nnn\cancel{n}}{3\cancel{n}} + \dfrac{36nn\cancel{n}}{3\cancel{n}} + \dfrac{15n\cancel{n}}{3\cancel{n}} + \dfrac{21\cancel{n}}{3\cancel{n}}$

$\dfrac{9}{3}n \cdot n \cdot n + \dfrac{36}{3}n \cdot n + \dfrac{15}{3}n + \dfrac{21}{3}$

$3n^3 + 12n^2 + 5n + 7$

12

(15) $\triangle BAD$, $\angle A = 90°$

~~$\triangle BOC$~~

$\triangle AOB$ → angle at O is $180 - 118 = 62$

Since $\overline{OB}$ = Radius = $\overline{OA}$, then $\triangle AOB$ is an isosceles Triangle!

this means 2 angles are equal

$180 = 62 + 2y$

$180 - 62 = 2y$

$118 = 2y \Rightarrow \boxed{y = \frac{118}{2} = 59°}$

$\triangle DOC$ = isosceles, so $\angle D = 36°$

$\angle C = 36°$

$\angle O = 180 - 72$

$= 108$

$\triangle BOC$ → $\angle O = 180 - 108 = 72$

$\triangle BOC$ is isosceles, so $2x + 72 = 180$

$2x = 180 - 72 = 108$

$\boxed{x = \frac{108}{2} = 54°}$

So

$x + y = 54° + 59° = 113°$

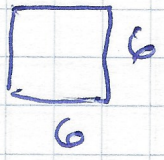
C

16

• 16 cubes × 6 = 96 faces

96 faces − 11 faces (bottom) − (15 faces ×2) (overlap)

96 − 11 − 30 = 96 − 41 = 55 faces



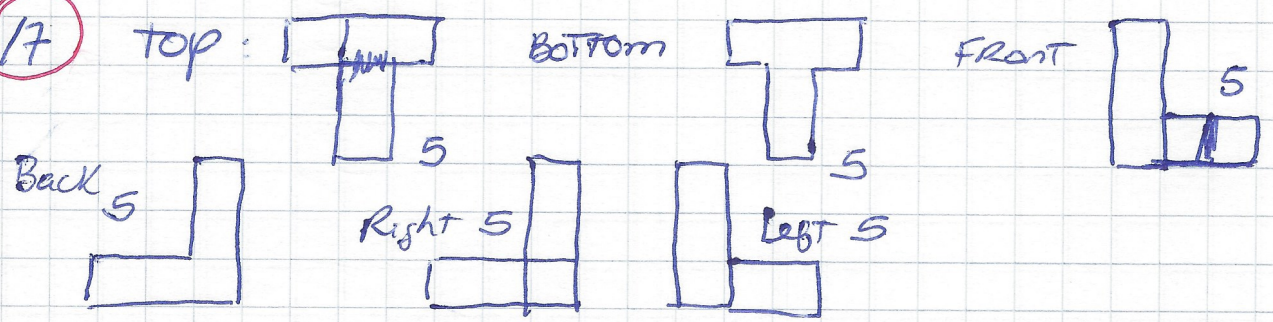
Each face has

$A = 6 \times 6 = 36\ cm^2$

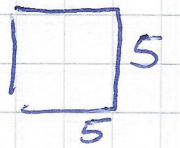
$(55 \times 36\ cm^2) = 1980\ cm^2$

B

17



Area of each face:



Total # of faces = (30) × 25 cm^2 = 750 cm^2

Method 2

Area of each face

= 25

7 cubes → 7×6 = 42 faces × 25 = 1050 cm^2

Overlaps = $6 \times 2 = 12$

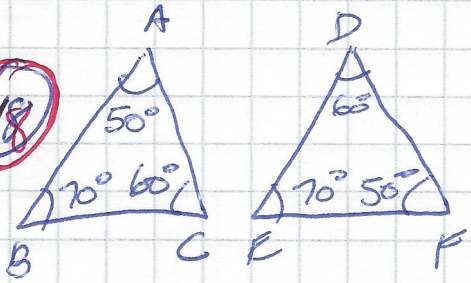
Area of overlaps = $12 \times 25 = 300\ cm^2$

Total Area = Area of 42 faces − Area of overlaps

$1050\ cm^2 - 300\ cm^2$

$= 750\ cm^2$

18



Since $\angle A = \angle D$, and the Triangles are similar, It means that other angles must be equal.

Therefore, $\angle C = \angle F$ (A)

19 $\triangle ABC$ is similar to $\triangle FED$ because

$\angle A = \angle F$
$\angle B = \angle E$
$\angle C = \angle D$

(D)

20 Quadrilateral ABCD is enlarged to Quadrilateral MNPQ. then,

$$\frac{24\ m}{20\ m} = \frac{\overline{QP}}{50m} \qquad \overline{QP} = \frac{24m \times 50m}{20\ m} = \frac{1200\ m^2}{20\ m}$$

$$\overline{QP} = 60\ m$$

21 Since these people are members of a society that considers Pluto a planet, then asking which is their favourite planet seems a redundant question. And if Pluto weren't their favourite planet, it'd be difficult for them to say it.

(A)

(22) People on the food court are probably there voluntarely. They are assumed to be back at some point. Therefore, they are the most likely to be targeted

C

(23) The opinion of adults and children would be important.

D

(24) Once the research question is picked, the next step is to select and identify a method of collecting data.

B

(25) Scale of $\frac{1}{4}$

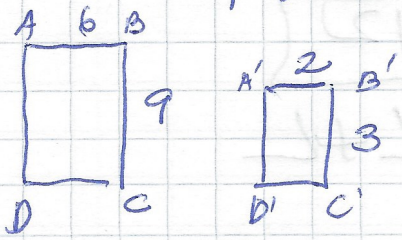
A is $(-8,4) \xrightarrow{1/4} (-8 \times \frac{1}{4}, 4 \times 1/4) = (-2, 1) = A'$

B is $(-4,0) \xrightarrow{1/4} (-4 \times \frac{1}{4}, 0 \times 1/4) = (-1, 0) = B'$

C is $(-8,-4) \xrightarrow{1/4} (-8 \times \frac{1}{4}, -4 \times \frac{1}{4}) = (-2, -1) = C'$

D is $(-12,0) \xrightarrow{1/4} (-12 \times \frac{1}{4}, 0 \times \frac{1}{4}) = (-3, 0) = D'$

(26)



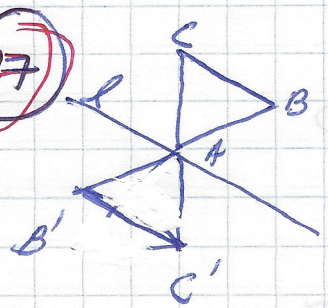
$S.F = \frac{New}{old}$

B

$\frac{A'B'}{AB} = \frac{2}{6} = \frac{1}{3}$ $\frac{B'C'}{BC} = \frac{\ }{\ } = \frac{1}{3}$

C

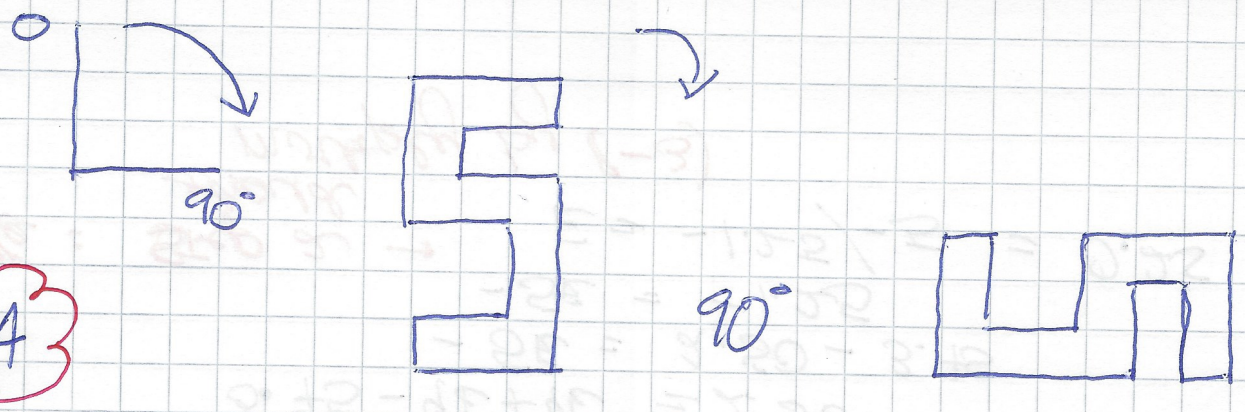
(27)



- Although it looks like a reflection, it is not because B' and C' are not placed correctly
- If you rotate about A, $\triangle ABC$ matches $\triangle AB'C'$

C

28



A

29 $\underbrace{3\times 3}\times 3\times 3$ is 3 four times

$\underbrace{9\times 3}\times 3$

$27\times 3 = 81$

$\downarrow 3^4$

C

30 $\frac{1}{8}$ of $2^6 \rightarrow 2^6 = 2\times 2\times 2\times 2\times 2\times 2 = 64$

$\frac{1}{8}\times 64 = 8$ or $\frac{2^6}{2^3} = 2^{6-3} = 2^3 = 8$

$\hookrightarrow 2^3$

A

31 $4^2\times 4^{10} \div 4^9$ Bedmas

$\frac{4^{10}}{4^9} = 4^{10-9} = 4^1$

$4^2\times 4^1 = 4^{2+1} = 4^3$

C

32 $\left(\frac{9}{5}\right)^2 = \left(\frac{9^2}{5^2}\right)$

$\hookrightarrow \frac{81}{25}$

D

33 $\left(\frac{2}{5}\right)^2 = \frac{4}{25} = 0.16$

34 $2\frac{3}{5} + 4.4 + (-5.2) + \left(-1\frac{3}{10}\right)$

$\downarrow$

$\frac{13}{5} + 4.4 + (-5.2) + \left(-\frac{13}{10}\right)$

$\downarrow$

$2.6 + 4.4 + (-5.2) + (-1.3) = 7.0 - 6.5$

$= 0.5 = \frac{1}{2}$

C

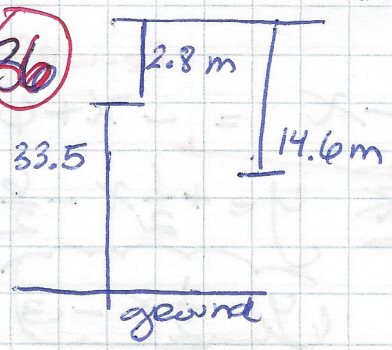
35 $\frac{1}{16} \times 7$ times $= \frac{7}{16}$

$\frac{7}{16} \times 40\ L = \frac{280}{16} L = 17.5\ L$

OR

$\hookrightarrow 2.5\ L$ per trip $\times$ 7 trips

36



$(33.5 + 2.8) - 14.6 = 36.3 - 14.6$

$= 21.7$

21.7 m

37 $8.1 - (2.4 \times 2.4) - (-3)^2 + 6^2 \div 3 \times 2.15$

$\downarrow$ ① $\downarrow$ ①

$9 + (36 \div 3)$

D

$\downarrow$ ②

$-9 + (12 \times 2.15)$

$\downarrow$ ③

$\downarrow$ ③

$8.1 - 5.76 - 9 + 25.8 = 33.9 - 14.76 = 19.14$

38

$Cc = 3 \times (\$5.49)$

$Jc = 7 \times (\$1.29)$ total $= Cc + Jc + Chc$

$Chc = 4 \times (\$5.99)$

$(3 \times 5.49) + (7 \times 1.29) + (4 \times 5.99)$

B

39 $3x^2 = 147$ $x^2 = \frac{147}{3} = 49$ C

$x^2 = 49 \Rightarrow$ then $x = \sqrt{49} = 7$

40 $\sqrt{1004} = 31.68$ $\sqrt{1024} = 32$ C

$\sqrt{1016} = 31.87$ $\sqrt{1036} = 32.18$

41 $\sqrt{?} = 0.5$ $(0.5)^2 = (0.5) \times (0.5) = 0.25$

42 $\sqrt{75} = ?$ $\sqrt{75}$ is between $\sqrt{64}$ and $\sqrt{81}$

$\approx 8.\frac{6}{11} \approx 8.7$ 11 → 8 6 → 9

B

43 $\sqrt{726} = 26.94$ A

44

Shape (x)	Candies
1	3
2	5
3	7

+2

$2x$ when $x=1$ $2(1) = 2$ TO 3

+1

$y = 2x + 1$

B

45 $\underbrace{(x) + (x+1)}_{\text{implies consecutive numbers}} = 17$

C

46 Danielle → $\overbrace{6x - 7}^{\text{Katherine}}$ marbles

$119 = 6x - 7$

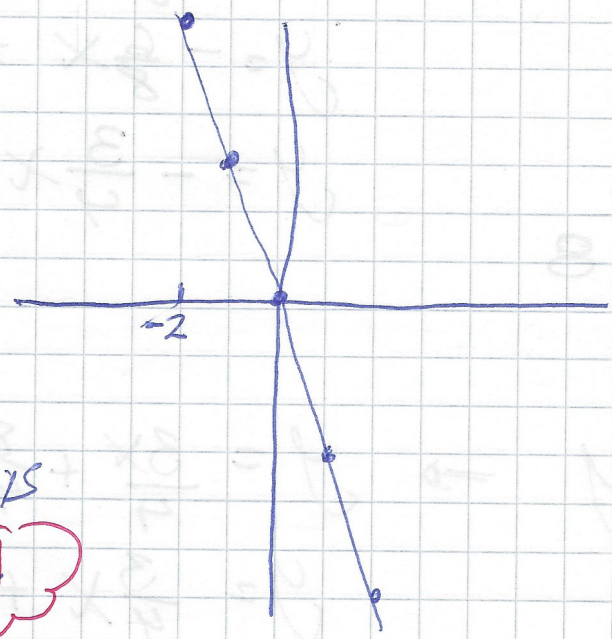
$119 + 7 = 6x$

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

$21 = x$

47 x, y

-2, 6
-1, 3
0, 0
1, -3
2, -6



this graph is

A

48 $50 → old start

- new price starts at 0.

1 day — 10 $ 10 days — 100 $

5 days — 50 $ 20 days — 200 $

the graph that matches the information above.

C

49 10% chance of snow — October 31
3 times as likely

(10%) x (3) = 30% → Snow probability A

So 70% chance it will NOT SNOW

50 the central angle θ "comes from" BC.

C