A1 Skills Review

① $3(2x-4) = -18$ (distribute)

$6x - 12 = -18$

yes... equal. used the distributive property (C)

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② $\sqrt{16} + \sqrt[3]{8} = 4 + 2 = \boxed{6}$ (B)

$\sqrt{16}$: b/c $4 \cdot 4 = 16$; $\sqrt[3]{8}$: b/c $2 \cdot 2 \cdot 2 = 8$

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③ $x^6 x^2 = x^{6+2} = \boxed{x^8}$

A. $x^4 x^3 = x^{4+3} = x^7$ NO

[B] $x^5 x^3 = x^{5+3} = x^8$ yes

C. $x^7 x^3 = x^{7+3} = x^{10}$ NO

D. $x^9 x^3 = x^{9+3} = x^{12}$ NO

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④ the reciprocal of A is $\frac{1}{A}$ (so basically you flip the fraction $\frac{A}{1}$)

You cannot divide by zero... so 0 doesn't have a reciprocal (B)

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⑤ multiplicative inverse is the same as the reciprocal (so the flipped version of the fraction)

so flip $\frac{1}{2}$ to get $\frac{2}{1} = \boxed{2}$ (D)

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⑥ $|2x-3| = 5$ means either

$2x - 3 = 5$ OR $2x - 3 = -5$

$2x = 8$ $2x = -2$

$\boxed{x = 4}$ $\boxed{x = -1}$ (C)

(7) $5 - |x+4| \leq -3$
$-5 \quad -5$ SA

$\frac{-|x+4|}{-1} \leq \frac{-8}{-1}$ DM

solve down to abs. value w/ SADMEP (PEMDAS backwards)

flip inequality sign when you mult or divide by ⊖

$|x+4| \geq 8$ "abs. val greater than" = OR

⊕ case: $x+4 \geq 8$ OR ⊖ case: $x+4 \leq -8$ ← flip inequality sign for ⊖ case

$x \geq 4$ or $x \leq -12$ (D)

(8) $5x - 2(7x+1) = 14x$

$5x - 14x - 2 = 14x$

$-9x - 2 = 14x$ (A)

(9) $4(2-5x) = 6 - 3(1-3x)$

$8 - 20x = 6 - 3 + 9x$

$8 - 20x = 3 + 9x$

$+20x \quad +20x$

$8 = 3 + 29x$

$-3 \quad -3$

$5 = 29x$

so

$29x = 5$ (C)

(10) $C = 360$

$C = 120 + 60n$

$360 = 120 + 60n$ SA

$-120 \quad -120$

$\frac{240}{60} = \frac{60n}{60}$ DM

$4 = n$ (B)

(11) $3(x+5) = 2x + 35$

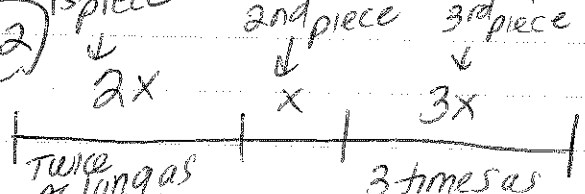
$3x + 15 = 2x + 35$

$-2x \quad -2x$

$x + 15 = 35$ ★step 2 says $5x + 15 = 35$

(B)

(12)



TOTAL $= 2x + x + 3x$

$= 6x$

$120 = 6x$ (C)

$x = 20$

longest piece $= 3x$

$= 3(20) = 60$

(13) cost per hour · hour · Flat rate for day

$250x + 750 \leq 2500$ (Total daily cost)

SA: $-750 \quad -750$

DM: $\frac{250x}{250} \leq \frac{1750}{250}$

$\boxed{x \leq 7}$ (C)

(14) $x - 5 > 14$

$+5 \quad +5$ SA

$\boxed{x > 19}$ (B)

(15) Perimeter = sum of sides

side 1 + side 2 + side 3 = perimeter

$y + y+1 + 7 = 56$

$2y + 8 = 56$

$2y = 48$

$\boxed{y = 24}$ (A)

(16) you need A number that is Divisible by neither 2 nor 3

~~(A)~~ no, 100 is Divisible by 2, $100/2 = 50$

~~(B)~~ no, 57 is Divisible by 3, $57/3 = 19$

~~(C)~~ no, 30 is Divisible by both $\frac{30}{3} = 10$, $30/2 = 15$

★ (D) 25 is A ⊕ integer but is Not Divisible by 2 or 3

(17) the "conclusion" is the statement After "then"

so "$x = -2$ or $x = 2$" (D)

(18) (D) Anyone that is in the band is A good musician, thus D is true

(19) plug in x for each value given, see which does NOT yield a prime #

A. $(5)^2+5+5 = 25+10 = 35$ ← NOT prime

NO NEED to check B, C, D $35 = 5 \cdot 7$ or $1 \cdot 35$ ← not prime

---

(20) Step 2, John set two factors equal to zero. this is the "zero product property" (B)

IF $AB=0$ then $A=0$ or $B=0$

---

(21) $n+8(n+20) = 110$

$n+8n+160 = 110$ ← Stan is wrong in step 1 (B)

---

(22) "the opposite of a number is less than the original number" is only true if the original is positive (thus the opposite is negative and $-<+$) (C)

You can also test #'s to see that

A. never true # = 7, opposite = −7, $-7 < 7$ ✓ ← true here

B. always true # = 0, opposite = 0, $0 < 0$ false here

(C) positives only ← yup (see ex. in A.

D negatives only ← nope # = −5, opp = 5, $5 < -5$ false

---

(23) $4x+2y=12$ solve for y to get $y=mx+b$ (y-int)

$\frac{2y}{2} = \frac{-4x}{2} + \frac{12}{2}$ SA DM

$y = -2x + 6$

y-INT IS 6 (C)

(24) • IT'S shaded above, so y is "greater than" (NOT A or B)
• IT'S A solid line so y is "equal to" (NOT A or C)
SO IT HAS to be (D) $y \geq \frac{1}{2}x - 1$

All 4 ANS have same $mx+b$

---

(25) $y = 2x - 2$

y-INT @ $y = -2$ (NOT B or D)

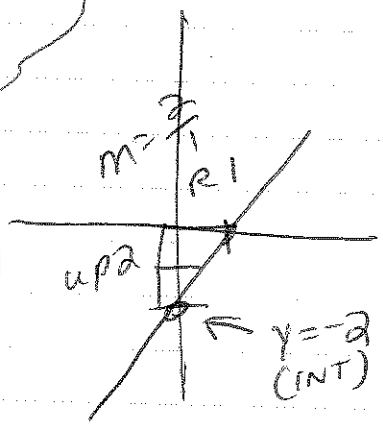
$m = \frac{2}{1}$ ← rise up 2 / ← run right 1

SO ↗ not ↖

(+) slope (−) slope

(NOT C or B)

SO (A)



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(26) graph is shaded below ($y <$ or $y \leq$)
graph is solid line (so "equal to")
y-INT is @ $y = 2$
slope = $\frac{\text{down } 3}{\text{right } 1} = \frac{-3}{1} = -3$

$y \leq -3x + 2$ ← see which ANS matches

$+3x \quad +3x$

$3x + y \leq 2$ (A)

(27) line has y-int @ $y=0$ (the origin)

line has slope $m = \frac{2 \text{ up}}{1 \text{ right}} = \frac{2}{1}$

$y = 2x + 0$ (B)

---

(28) $3x + 6y = 2$ just plug in to see which gives true statement

~~(A)~~ $(0,2)$
$3(0) + 6(2) = 2$
$12 = 2$
NO

~~(B)~~ $(0,6)$
$3(0) + 6(6) = 2$
$36 = 2$
NO

★ (C) $3(1) + 6(-\frac{1}{6}) = 2$
$3 + -1 = 2$
$2 = 2$
yes

---

(29) point-slope is best here

$y - y_1 = m(x - x_1)$
$y - (-10) = 4(x - 3)$
$y + 10 = 4x - 12$
$-10 \quad -10$
$y = 4x - 22$

OR slope-int

$y = 4x + b$
$-10 = 4(3) + b$
$-10 = 12 + b$
$-12 \quad -12$
$-22 = b$

$y = 4x - 22$

(C)

(A) c is the "y" and h is the "x"

(30) $m = \frac{\Delta c}{\Delta h} = \frac{30 - 15}{5 - 2} = \frac{15}{3} = 5$

point-slope

$c - c_1 = m(h - h_1)$
$c - 15 = 5(h - 2)$
$c - 15 = 5h - 10$
$c = 5h + 5$

or $c = mh + b$

$c = 5h + b$
$15 = 5(2) + b$
$15 = b$
$-10 \quad 5 = b$
$c = 5h + 5$

(C)

(31) $m = \frac{\Delta y}{\Delta x} = \frac{7-1}{3-1} = \frac{6}{2} = 3$ ← so it's (C) (the only EQ with $m=3$)

$y = 3x - 2$

you CAN finish it (but why?)

$y - y_1 = m(x - x_1)$

$y - 1 = 3(x-1)$

$y - 1 = 3x - 3$

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

(32) PUT BOTH in slope-int

line ℓ	line q
$6x+5y=3$	$5x-6y=0$
$\frac{5y}{5} = \frac{-6x}{5} + \frac{3}{5}$	$\frac{-6y}{-6} = \frac{-5x}{-6}$
$y = -\frac{6}{5}x + \frac{3}{5}$	$y = \frac{5}{6}x$
$m = -6/5$	$m = 5/6$
$b = 3/5$	$b = 0$

← NOT A →

~~(A)~~ NO, one is 3/5, other is 0

~~(B)~~ no, slopes are not equal

~~(C)~~ no, plug in $y=0$

$6x + 0 = 3$ $\quad$ $5x = 0$

$x = 1/2$ $\quad$ $x = 0$

↖ not the same ↗

★ (D) Yes! Slopes are opposite reciprocals

(33) parallel means same slope

$y = \frac{-5}{4}x + 2$

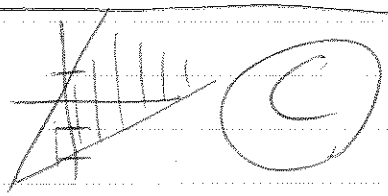
$\uparrow m = \frac{-5}{4}$

So (A) (only one w/ slope $= \frac{-5}{4}$)

(34) ① $2x \geq y - 1$

② $2x - 5y \leq 10$

↑ symbol is missing in PDF so I wrote it in



(C)

① $-y \geq -2x - 1$

$y \leq 2x + 1$

(below, solid line

② $-5y \leq -2x + 10$

$y \geq \frac{2}{5}x - 2$

(solid line shade above)

(35) $\begin{cases} y = -3x - 2 \\ 6x + 2y = -4 \end{cases}$

substitution

$6x + 2(-3x - 2) = -4$

$6x - 6x - 4 = -4$

$-4 = -4$

all variables cancel to leave true statement

SO INFINITE SOLNS

(D)

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(36) $\begin{cases} x + 3y = 7 \\ (x + 2y = 10)(-1) \end{cases} \rightarrow \begin{array}{r} x + 3y = 7 \\ -x - 2y = -10 \end{array}$

$y = -3$ ← has to be

(D)

but if you want to finish...

plug $y = -3$ into either EQ

$x + 3(-3) = 7$

$x - 9 = 7$

$\boxed{x = 16}$ → $(16, -3)$

$(\_\_, -3)$

---

(37) d = dimes, Q = quarters

$(d + Q = 100)(-.10) \rightarrow -.10d - .10Q = -10$

use elimination

$.10d + .25Q = 14.05$

$.10d + .25Q = 14.05$

$.15Q = 4.05$

$Q = \frac{4.05}{.15} = 27$

(A)

(38) $y = -2x + 3$ ← same (identical) line

$\frac{5y}{5} = \frac{-10x}{5} + \frac{15}{5}$ → $y = -2x + 3$

(A)

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(39) $\frac{6x^3}{10x^7} = \frac{3 \cdot x \cdot x \cdot x}{5 \cdot 2 \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x}$

$= \frac{1}{2 \cdot x \cdot x \cdot x \cdot x} = \boxed{\frac{1}{2x^4}}$ (B)

---

(40) $(4x^2 - 2x + 8) - (x^2 + 3x - 2)$

$= 4x^2 - 2x + 8 - x^2 - 3x + 2$

$= 3x^2 - 5x + 10$ (D)

---

(41) let $P(x)$ be the "mystery polynomial"

$3x^2 - 2x + P(x) = 5x^2 - 6x$ solve for $P(x)$

$-3x^2 + 2x \qquad -3x^2 + 2x$

$\boxed{P(x) = 2x^2 - 4x}$ (A)

---

(42) $(x+2) + (x-2)(2x+1)$

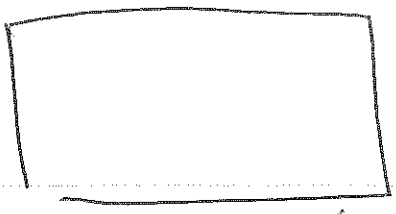
FOIL

F + O + I + L

$x + 2 + 2x^2 + x - 4x - 2$

$= 2x^2 + (-2x) + 0 = \boxed{2x^2 - 2x}$ (A)

(43)



(not drawn to scale)

$A = L \cdot W = 2x \cdot x = \boxed{2x^2}$ (B)

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(44) $3a^2 - 24ab + 48b^2$ ← GCF of 3... SO ANS is C or D

$3(a^2 - 8ab + 16b^2)$

front seats $a \cdot a$

sign is ⊖

same sign

back seats need to multiply to $16b^2$ so

$4b \cdot 4b$
$2b \cdot 8b$
$1b \cdot 16b$

$= \boxed{3(a-4b)(a-4b)}$ (C)

OR FOIL out all ANS, see which is right

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(45) $x^2 - 11x \oplus 24$ $= (x-3)(x-8)$ (B)

$x \cdot x$ front seats

same sign

sign is ⊖

back seats
1, 24
2, 12
3, 8
4, 6

check by Foiling

$x^2 - 3x - 8x + 24$

$x^2 - 11x + 24$ ✓

---

(46) $9T^2 + 12T \oplus 4$ $= (3T+2)(3T+2)$

$3T \cdot 3T$
$1T \cdot 9T$

same sign

sign is ⊕

$2 \cdot 2$
$1 \cdot 4$

ALWAYS guess middle #'s (closer together first)

FOIL to check

$9T^2 + 6T + 6T + 4$

$= 9T^2 + 12T + 4$ ✓

ANS: $(3T+2)^2$ (A)

(47) $32-8z^2$

$-8(z^2-4)$ ← ① take out GCF

← ② binomial is difference of squares (D.O.S)

$A^2-B^2=(A+B)(A-B)$

$-8(z+2)(z-2)$

ANS... but not listed... so they must have only taken out 8 as GCF

$32-8z^2 = 8(4-z^2) = 8(2+z)(2-z)$

D.O.S

(B)

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(48) $x^2+x=42$

solve for x by making one side = 0 then factoring

$x^2+x-42=0$

$x \cdot x$

-42: $6,7$ / $3,14$ / $2,21$ / $1,42$ (opposite signs)

$(x+7)(x-6)=0$

solve

$x+7=0$ → $x=-7$ ★ (A)

$x-6=0$ → $x=6$

Foil to check

$x^2+7x-6x-42$

x^2+x-42 ✓

OR plug in ANS to see which yields 42

(A) $(-7)^2+(-7)=49-7=42$ ✓

B. $(-6)^2+-6=36-6=30$ NO

C. $(14)^2+14=196+14=210$ NO

D. $(42)^2+42=$ WAY TO BIG NO

(49) $x^2 - 8x = 5$

$1(x^2 - 8x + 16) = 5 + 16$

$\div 2 \downarrow$ (-4) SQ

ADD 16 TO both sides

(C)

---

(50) $x^2 + 6x = 16$

$x^2 + 6x - 16 = 0$

$x \cdot x$; opp signs ; 1·16, 4·4, (2·-8) ← look at ANS -- it's this

$(x+8)(x-2) = 0$ ← FOIL to check

$x^2 + 8x - 2x - 16$

$x^2 + 6x - 16$ ✓

$x + 8 = 0$ $\quad x - 2 = 0$

$\boxed{x = -8}$ $\quad \boxed{x = 2}$ (C)

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(51) $x^2 + 4x = 6$

$1(x^2 + 4x \underline{+4}) = 6 \underline{+4}$

$\div 2 \downarrow$ (+2) SQ

$(x^2 + 4x + 4) = 10$

$(x+2)^2 = 10$ (B)

(52) $10x^2 - 25x + 15 = 0$

GCF 5: $5(2x^2 - 5x + 3) = 0$

$2x \cdot x$; $-1 \cdot -3$

same sign

sign is (−) ← so NOT A or C

$5(2x - 3)(x - 1)$

check by FOIL

F O I L

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

$2x^2 - 5x + 3$ ✓

(D)

---

(53) $x^2 + \frac{b}{a}x + \left(\frac{b}{2A}\right)^2 = \frac{-c}{a} + \left(\frac{b}{2A}\right)^2$ (D)

$\div 2$ → $\frac{b}{2A}$ → SQ

---

(54) $ax^2 + bx + c = 0$

$x^2 + \frac{b}{a}x + \frac{c}{a} = 0$

(I) $x^2 + \frac{b}{a}x = \frac{-c}{a}$

(IV) $x^2 + \frac{b}{a}x + \left(\frac{b}{2A}\right)^2 = \frac{-c}{a} + \left(\frac{b}{2A}\right)^2$

$\div 2$ → $\left(\frac{b}{2A}\right)$ → SQ

$\left(\frac{4A}{4A}\right)$

$\left(x + \frac{b}{2A}\right)^2 = \frac{-c}{a} + \frac{b^2}{4A^2}$

get common denom of $4A^2$

(II) $\left(x + \frac{b}{2A}\right)^2 = \frac{b^2 - 4Ac}{4A^2}$

so III has to be LAST ...

order is I, IV, II, III

(A)

(55) For $ax^2+bx+c=0$; solns are $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$ (the quadratic formula)

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

$A=2, B=-1, C=-4$

$x = \frac{-(-1) \pm \sqrt{(-1)^2-4(2)(-4)}}{2(2)} = \frac{1 \pm \sqrt{1+32}}{4}$

$x = \frac{1 \pm \sqrt{33}}{4}$ → $x = \frac{1+\sqrt{33}}{4}$ (C)

→ $x = \frac{1-\sqrt{33}}{4}$

---

(56) $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$ ← "b^2-4ac" is the Discriminant

$2x^2 + x + 7 = 0$

$A=2, B=1, C=7$

$B^2 - 4AC$

$1^2 - 4(2)(7)$

$1 - 56$

$-55 < 0$

(C)

IF $b^2-4ac > 0$ then two real solns

IF $b^2-4ac = 0$ then one real soln

IF $b^2-4ac < 0$, then no real soln

(57) $8x^2+2x+1=0$

$A=8, B=2, C=1$

4-32

$$x=\frac{-2\pm\sqrt{2^2-4(8)(1)}}{2(8)}=\frac{-2\pm\sqrt{-28}}{16}$$

(D) no real soln

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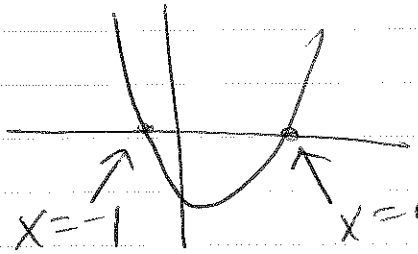
(58) $y=0$ means the x-intercepts (so the x-values where the graph hits the x-axis)

So



(C)

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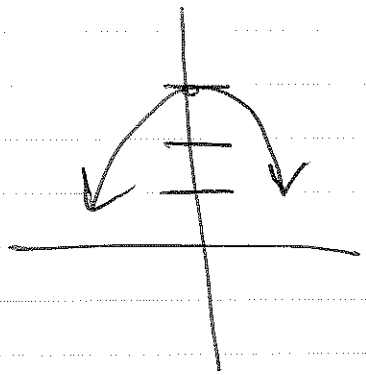
(59) $y=-x^2+3$

↑ frown ↑ w/ y-int at (0,3)



(B)

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(60) X-INT: $x=4$ and $x=-3$

means factors are $x-(4)$ and $x-(-3)$

$y=A(x-4)(x+3)$ ← since this isn't a choice, look at Ans

↑ possible GCF

(B) $y=(x+3)(2x-8)$

GCF of 2

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

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

how MANY x-intercepts is ASKING how MANY real solns to

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

so use DISCRIMINANT ($B^2 - 4AC$) since you only WANT <u>how MANY</u> (not the actual solutions)

$A = 2, B = -2, C = 3$

$B^2 - 4AC = (-2)^2 - 4(2)(3) = 4 - 24 = -20 < 0$

NO REAL SOLNS (A)

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(62) $S = vt + 16t^2$ given $v = 10$ FIND t that makes $S = 84$

$84 = 10t + 16t^2$

$0 = 16t^2 + 10t - 84$

$0 = 2(8t^2 + 5t - 42)$

$0 = 2(t - 2)(8t + 21)$ ← <u>or</u> use $A = 16, B = 10, C = -84$

$2 = 0$ i.e. $t = 2$ $t = -\frac{21}{8}$ not logical for A time

$x = \frac{-B \pm \sqrt{B^2 - 4AC}}{2A}$

(A)

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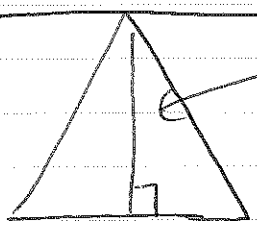
(63)



$h = 2x + 4$ (4 inches greater than twice the base)

x = base

$A = \frac{1}{2}bh = \frac{1}{2}(x)(2x+4)$

$A = x^2 + 2x$

$168 = x^2 + 2x$

$0 = x^2 + 2x - 168$ 14 · 12

$(x + 14)(x - 12) = 0$

$x = -14$ not logical

$x = 12$ (C)

(64) $\frac{x^2-4xy+4y^2}{3xy-6y^2} = \frac{(x-2y)(x-2y)}{3y(x-2y)}$ gcf

$= \boxed{\frac{x-2y}{3y}}$ (B)

---

(65) $\frac{6x^2+21x+9}{4x^2-1} = \frac{3(2x^2+7x+3)}{(2x+1)(2x-1)}$ gcf

$2x \cdot x$; sign same sign (+) ; $1 \cdot 3$

$\leftarrow$ 0.0.S $\rightarrow$

$= \frac{3(2x+1)(x+3)}{(2x+1)(2x-1)} = \boxed{\frac{3(x+3)}{2x-1}}$ (B)

---

(66) $\frac{x^2-4x+4}{x^2-3x+2} = \frac{(x-2)(x-2)}{(x-1)(x-2)} = \boxed{\frac{x-2}{x-1}}$ (A)

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(67) $\frac{12a^3-20a^2}{16a^2+8a} = \frac{4a^2(3a-5)}{8a(2a+1)}$ gcf

$= \frac{2 \cdot 2 \cdot 4 \cdot a (3a-5)}{2 \cdot 2 \cdot 2 \cdot 4 (2a+1)} = \boxed{\frac{a(3a-5)}{2(2a+1)}}$ (D)

(68) $\dfrac{7z^2+7z}{4z+8} \cdot \dfrac{z^2-4}{z^3+2z^2+z} =$

FACTOR ALL FOUR polynomials
GCF, DIFF. OF SQS

$$\frac{7z(z+1)}{4(z+2)} \cdot \frac{(z+2)(z-2)}{z(z^2+2z+1)}$$

GCF, GCF, keep factoring ← z^2+2z+1 $(z+1)(z+1)$

$$= \frac{7z(z+1)(z+2)(z-2)}{4z(z+2)(z+1)(z+1)} = \boxed{\frac{7(z-2)}{4(z+1)}}$$ (A)

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(69) $\left(\dfrac{x+5}{3x+2}\right)\left(\dfrac{2x-3}{x-5}\right)$ ← no factors are identical on top AND bottom (nothing cancels) so FOIL

$$\frac{(x+5)(2x-3)}{(3x+2)(x-5)} = \frac{2x^2-3x+10x-15}{3x^2-15x+2x-10}$$

(minus)

$$= \boxed{\frac{2x^2+7x-15}{3x^2-13x-10}}$$ (minus) (D)

sorry... Almost "3x-2" wrote instead which messed up some signs (")

(70) $\dfrac{x^2+8x+16}{x+3} \div \dfrac{2x+8}{x^2-9}$

$x \cdot x$ ↙ sign (+) ↘ same sign 4, 4

$\dfrac{(x^2+8x+16)}{(x+3)} \cdot \dfrac{(x^2-9)}{(2x+8)}$ ← difference of squares

FLIP AND multiply by reciprocal

NOW FACTOR All FOUR polynomials.

$\dfrac{(x+4)(x+4)}{(x+3)} \cdot \dfrac{(x+3)(x-3)}{2(x+4)}$ GCF 2

$= \dfrac{(x+4)(x+4)(x+3)(x-3)}{2(x+3)(x+4)} = \boxed{\dfrac{(x+4)(x-3)}{2}}$ (C)

---

(71) $\dfrac{\frac{3x}{5}}{\frac{x}{4}+\frac{x}{2}}$ ← make one fraction w/ common denom → $\dfrac{\left(\frac{3x}{5}\right)}{\frac{x}{4}+\frac{2x}{4}} = \dfrac{\left(\frac{3x}{5}\right)}{\left(\frac{3x}{4}\right)}$

$= \dfrac{3x}{5} \div \dfrac{3x}{4} = \dfrac{3x}{5} \cdot \dfrac{4}{3x} = \dfrac{12x}{15x} = \boxed{\dfrac{4}{5}}$ (C)

FLIP to multiply by reciprocal

---

(72) x = 10% soln Amount

y = 15% soln Amount

$x + y = 100$ ← TOTAL soln ($\cdot 10$)

$.10x + .15y = .12(100)$ ← Amt of actual saline

(A)

use elimination

$-.10x + -.10y = -10$

$.10x + .15y = 12$

$.05y = 2$

$y = \dfrac{2}{.05}$

$y = 40$ mL

$x = 100 - y$

$\boxed{x = 60 \text{ mL}}$

(73) over whole trip, ANDY DROVE
$45\text{mph} \cdot 4\text{hr} = \boxed{180 \text{ miles}}$

IF he DROVE $40\text{mph} \cdot 3\text{hr} = 120$ miles in the first three hours, he must have DRIVEN $180 - 120 = 60$ miles in the final hour... thus his speed WAS $\boxed{60\text{mph}}$ (B)

---

(74) 1st PIPE has speed: $\frac{1 \text{ tank}}{20 \text{ min}} = \frac{1}{20} \frac{\text{tank}}{\text{min}}$

2nd pipe has speed: $\frac{1 \text{ tank}}{30 \text{ min}} = \frac{1}{30} \frac{\text{tank}}{\text{min}}$

SO in one minute together, the fill $\left(\frac{1}{20} + \frac{1}{30}\right)$ tank per min

$= \frac{3}{60} + \frac{2}{60} = \frac{5}{60} = \frac{1}{12}$ tank per min

thus, to fill the whole tank together will take $\boxed{12 \text{ MIN}}$

(NOTE A: 60 min, B: 25 min make no sense... they can't possibly slow down by having more pumps working)

(D)

(75) each hour, they get 650 miles (400+250) farther apart. (x)

So the distance, d, between them is $d = 650x$

$1625 = 650x$

$\frac{1625}{650} = 2.5 = x$

2.5 hrs

(A)

---

(76) x = Amt pure juice

$1x + .10(2) = .25(x+2)$

(total Amt of fluid)

100% of x is juice

only 10% is juice

25% of whole Amt is juice

$x + .2 = .25x + .5$

$.75x = .3$

$x = .3/.75 = .4$ (A)

---

(77) A FXN MEANS NO repeats in X (DOMAIN)

~~(A)~~ no $x = 2$ repeats

(B) yes

~~(C)~~ no, $x = 4$ repeats

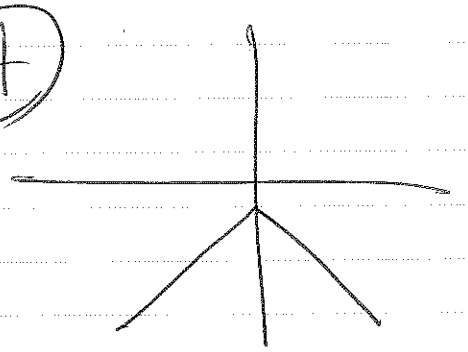
~~(D)~~ no, $x = 10$ repeats

(B)

(78) y-values negative means entire graph is below the x-AXIS (so in quadrants III and IV only)

NO	NO
yes	yes

(A)



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(79) DOMAIN is All x-values (inputs) of fxn... since the fxn is just four points

$\{(1,-4), (2,-5), (4,-1), (5,-2)\}$

D: $x = 1, 2, 4, 5$

$\{1, 2, 4, 5\}$ (D)

---

(80) To be A fxn graph must pass the vertical line test (ANY vertical line through the curve intersects at most ONCE)

(D) Fails