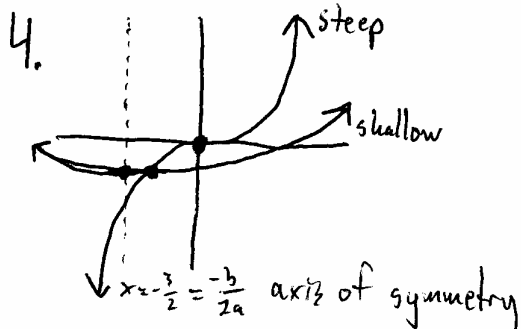


1. $3 \cdot 3^4 - 2 \cdot 3^2 + 4 \cdot 3 - 15$
 $243 - 18 + 12 - 15 = 222$ C

2. $2^3 - 3^6 = 8 - 729 = -721$ A

3. C commutative means the order doesn't matter



1 point of intersection B

5. $f(g(x)) = (5x+2)^2 - 3(5x+2)$
 $= 25x^2 + 20x + 4 - 15x - 6$
 $= 25x^2 + 5x - 2$ ①

$g(f(x)) = 5(x^2 - 3x) + 2$
 $= 5x^2 - 15x + 2$ ②

① - ② $\Rightarrow 20x^2 + 20x - 4$ B

6. a: $1.00 + .04 \cdot 20 = 1.80$

b: $.05 \cdot 20 = 1.00$

c: $.03 \cdot 10 + .06 \cdot 10 = .90$

$1.80 - .90 = .90$ A

7. $m = \frac{-a}{b} = \frac{-5}{\frac{2}{3}} = -\frac{5}{3}$ C

8. $5x+1 = 3x+2 \Rightarrow 2x = 1 \Rightarrow x = \frac{1}{2}$ E
 $y = \frac{7}{2}$

9. $x^2 + \frac{5}{2}x - \frac{3}{2} = 0$

$(x-r_1)(x-r_2) = 0 \Rightarrow r_1, r_2 = -\frac{3}{2}$ D

10. $\sqrt{(-2-3)^2 + (5-8)^2} = \sqrt{25+9} = \sqrt{34}$ D

11. This is an upward-pointing parabola w/ vertex $(5, -1) \Rightarrow$ III C

12. $m_1 = \frac{-a}{b} = -\frac{5}{3}$ $m_{\perp} = \frac{-1}{m_1} = \frac{3}{5}$ B

13. $y = x^2 \Rightarrow y^2 - 17y + 16 = 0$

$(y-16)(y-1) = 0$

$y = 16$ or $1 \Rightarrow x = \pm 4, \pm 1$ C

14. $\frac{(x+1)(x^2-2x-8)}{(x+1)(x^2+x-12)} = \frac{(x-4)(x+2)}{(x+4)(x-3)}$ B

15. They can't cooperate.

In 6 minutes, B \rightarrow B & T \rightarrow 4 = 7

$\frac{500}{7} = 71 \text{ r } 3 \Rightarrow 6 \cdot 71 = 426 = 7 \text{ hours } 6 \text{ min.}$

We need 3 more planes, which takes 3 minutes (B=1, T=2) \Rightarrow 7 hours, 9 min. A

16. $a=4x, b=5x$

$y = \frac{1}{2}(8x+5x) = \frac{13}{2}x$

$x=2, y=13, a=8, b=10$ A

17. $21-18=3$ A

18. We pick $2x$ three times
 & -5 three times.

There are $\binom{6}{3} = 20$ ways to do so.

$20 \cdot 2^3 \cdot (-5)^3 = -20,000$ B

19. $490x + 70(186-x) = 31090$

$\Rightarrow 7x + 186 - x = 444$

$6x = 258 \Rightarrow x = 43$ A

20. 7.4 is a bit less than half of 15
 so 12.3 is a good, fast guess.

$12 \cdot 15 + x \cdot 0 = (12+x) \cdot 0.74$

$12 \cdot 15 = 0.74x$

$12 \cdot 324 = x \Rightarrow$ A

21. $1C = \frac{3}{5}B = 3Y = 6W$ C

~~100~~

22. I like to work my way
 down the polynomial

$(x-3)(x^4 - 2x^3 + 5x^2 - 8x + 1)$ B

makes \uparrow makes the \uparrow makes the \uparrow this one
 $1x^5 - 3x^4$ other $-2x^4$ other $5x^3$ must work
 & $6x^3$ & $-15x^2$ for both x
 & constant

23. k in numerator, y in denominator D

24. disc = ~~disc~~ $b^2 - 4ac = 9 - 40 = -31$ A

It tells you how many real roots
 a quadratic has.

25. $y \geq +\text{slope}, y > -\text{slope}$

~~lines~~ meet at $(-a, -b)$ B

26. new drain time = $\frac{2 \cdot 3}{4} = \frac{3}{2}$

new fill time = $2 - 4 = 8$

$8 + \frac{3}{2} = \frac{19}{2} = 9.5$ D

~~27. $60t = 71(t-11)$~~

~~$781 = 11t \Rightarrow t = 71$~~

$60 \cdot \frac{t}{60} = 71 \left(\frac{t}{60} - \frac{11}{60} \right)$ didn't matter

$\frac{11}{60} \cdot 71 = 11 \left(\frac{t}{60} \right) \Rightarrow t = 71$ minutes

after Ike
 passed 1 mi.

$\Rightarrow 72$ minutes
 after start E

$$40. \quad N = D_i, \quad Q + D_o = D_i \\ \hookrightarrow D_o = 2$$

$$P + Q = N + D_i \Rightarrow \cancel{N + Q} \quad P = N + 2$$

$$D_o = 2, \quad Q = D_i + 2, \quad D_i = N = P - 2$$

$$Q = \overset{3}{\cancel{2}} \Rightarrow D_i = N = 5, \quad P = 7 \quad A$$

guess