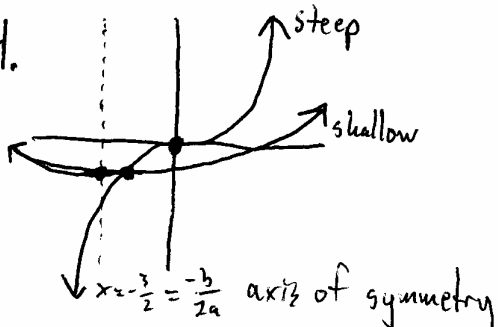
1. $3\cdot3^4-2\cdot3^2+4\cdot3-15$
$243-18+12-15=222$ C

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

3. C commutative means the order doesn't matter

4. 

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 ⇒ $20x^2+20x-4$ B

6. a: $1.00+.04\cdot20=1.80$
b: $.05\cdot20=1.00$
c: $.03\cdot10+.06\cdot10=.90$
$1.80-.90=.90$ A

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

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

9. $x^2+\frac{5}{2}x-\frac{3}{2}=0$
$(x-r_1)(x-r_2)=0 \Rightarrow r_1r_2=-\frac{3}{2}$ 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 $1 \Rightarrow x=\pm4, \pm1$ 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→B & T→4 = 7
$\frac{500}{7}=71$ r3 $\Rightarrow 6\cdot71=426=7$ hours 6 min.
We need 3 more planes, which takes 3 minutes (B=1, T=2) ⇒ 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. $490x+70(186-x)=31080$

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

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

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

$12\cdot.15+x\cdot 0=(12+x)\cdot.074$

$12\cdot(.15-.074)=.074x$

$12.\overline{378}=x \Rightarrow$ A

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

22. I like to work my way down the polynomial

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

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

23. k in numerator, y in denominator D

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

It tells you how many real roots a quadratic has.

25. $y\geq$ +slope, $y>$ −slope meet at $(-a,-b)$ B

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

new fill time $=2\cdot 4=8$

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

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

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

take hours vs. minutes ÷ didn't matter

$60\cdot\frac{t}{60}=71(\frac{t}{60}-\frac{11}{60})$

$\frac{11}{60}\cdot 71=11(\frac{t}{60}) \Rightarrow t=71$ minutes after Ike passed Imi.

$\Rightarrow 72$ minutes after start E

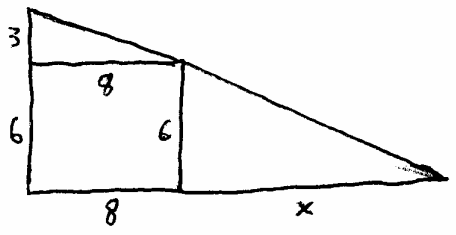
28. $\frac{\frac{c+2a+3b}{abc}}{\frac{2a+3b+c}{abc}} = 1$ A

29. 3, 11, 27, 51
+8 +16 +24 ⇒ arithmetic
⇒ quadratic
C works

30. $\frac{50+x}{317+x} \geq \frac{1}{4}$
$200+4x \geq 317+x$
$3x \geq 117 \Rightarrow x \geq 39$ B

31. interpolation is estimating between data points.
extrapolation is estimating beyond last point
linear regression is a way of determining a line which "best" fits the data. B

32. $x^2 - x - 42 = 0$
$(x-7)(x+6) = 0$ A

33.


Similar △s
$\frac{3}{8} = \frac{6}{x} \Rightarrow x = 16$
$8 + 16 = 24$ C

34. 8 pieces = $\frac{1}{3} \cdot 2x$
$12 = x$ D

35. $m = 9s$, $m+9 = 3(s+9)$
$9s = 3s + 18$
$6s = 18$
$s = 3 \Rightarrow m = 27$ A

36. abscissa is the x-value of an ordered pair
$\Sigma = 73.2$ D

37. $A = 24000e^{-\frac{\ln 2}{23.5} \cdot 20}$
$= 24000e^{-.58\ldots} = 13305.019\ldots$ C

38. $250000 \cdot 1.25 \cdot .85 \cdot .87 \cdot 1.05 \cdot .94 \cdot 1.35 \cdot 1.12 \cdot .97$
$= 334,525.23\ldots$ B

39. Without knowing the present value of the variables, we can't say which has the greatest influence on the value. D

40. $N=D_i$; $Q+D_0=D_i$

$\hookrightarrow D_0=2$

$P+Q=N+D_i \Rightarrow P=N+2$

$D_0=2$, $Q=D_i+2$, $D_i=N=P-2$

$Q=3 \Rightarrow D_i=N=5$, $P=7$ A

guess