Practice Test Solutions

1 a) -7

b) -7

c) -7

2) $\frac{1}{8}$

3) $7-2x$

4) $y = 136x + 173$

5) $-\frac{7}{9}$

6) 42

7) $\frac{1}{4}$

8 a) $C = 25 + 11.25m$

b) $C = \$655$

c) 80 people

9)

	f	f'	f''
A	−	+	−
B	+	0	−
C	+	−	−
D	0	−	+
E	−	−	+

4) $f(x) = 8x^3 - 10x^2 + 5$

SLOPE: $f'(x) = 24x^2 - 20x$

$f'(-2) = 24(-2)^2 - 20(-2)$

$= 24 \cdot 4 + 40$

$= 96 + 40$

$= 136$

POINT: $(-2, f(-2))$

$f(-2) = 8(-2)^3 - 10(-2)^2 + 5$

$= 8(-8) - 40 + 5$

$= -99$

$(-2, -99)$

EQ: $-99 = 136(-2) + b$

$-99 = -272 + b$

$173 = b$

$y = 136x + 173$

PPP

1) $f(x) = \begin{cases} x^3 - 5 & x \le 1 \\ x^2 - 3 & x > 1 \end{cases}$

a) $\lim\limits_{x \to 1^+} f(x) =$

b) $\lim\limits_{x \to 1^-} f(x) =$

c) $\lim\limits_{x \to 1} f(x) =$

2) $f'(4)$ if $f(x) = \frac{5}{x}$

$$f'(a) = \lim_{h \to 0} \frac{f(a+h) - f(a)}{h}$$

3) $f'(x)$ if $f(x) = 5x^2 - 4x + 3$

using $f'(x) = \lim\limits_{h \to 0} \frac{f(x+h) - f(x)}{h}$

4) Eq of tan line to $f(x) = 2x^5 - 8x^3 + 5x$ when $x = -1$

5) $\lim\limits_{h \to 0} \frac{5\sqrt{3+h} - 5\sqrt{3}}{h}$

6) $\lim\limits_{h \to 0} \frac{(6h-11)^2 - 121}{h}$

7) $\lim\limits_{x \to -11} \frac{x^2 + 7x - 44}{x^2 - 121}$

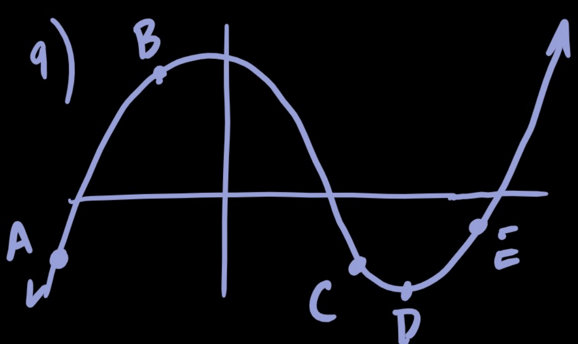
8) A car rental company charges a flat fee of \$75 plus \$0.60 per mile for the rental car

a) write cost C as a function of miles driven, m.

b) How much would you pay to go 750 miles?

c) How many miles for \$1095?

9)



	f	f'	f''
A			
B			
C			
D			
E			

1a) $1^2 - 3 = -2$

b) $1^3 - 5 = -4$

c) d.n.e

2) $f(x) = \frac{5}{x}$

$$f'(4) = \lim_{h \to 0} \frac{\frac{5}{4+h} - \frac{5}{4}}{h}$$

$$= \lim_{h \to 0} \frac{20 - 5(4+h)}{h(4+h)4}$$

$$= \lim_{h \to 0} \frac{\cancel{20} - \cancel{20} - 5\cancel{h}}{\cancel{h}(4+h)4}$$

$$= \frac{-5}{4 \cdot 4} = -\frac{5}{16}$$

3) $$f'(x) = \lim_{h \to 0} \frac{\left(5(x+h)^2 - 4(x+h) + 3\right) - (5x^2 - 4x + 3)}{h}$$

$$= \lim_{h \to 0} \frac{\cancel{5x^2} + 10xh + 5h^2 - \cancel{4x} - 4h + \cancel{3} - \cancel{5x^2} + \cancel{4x} - \cancel{3}}{h}$$

$$= \lim_{h \to 0} \frac{\cancel{h}(10x + 5h - 4)}{\cancel{h}}$$

$$= 10x + 5 \cdot 0 - 4$$

$$= 10x - 4$$

4) $f(x) = 2x^5 - 8x^3 + 5x$

$f'(x) = 10x^4 - 24x^2 + 5$

$m = f'(-1) = 10(-1)^4 - 24(-1)^2 + 5 = 10 - 24 + 5 = -9$

Point: $(-1, f(-1))$

$$f(-1) = 2(-1)^5 - 8(-1)^3 + 5(-1)$$
$$= -2 + 8 - 5 = 1$$

$$1 = -9\cdot(-1) + b$$
$$-8 = b$$

$$\boxed{y = -9x - 8}$$

5) $$\lim_{h\to 0} \frac{(5\sqrt{3+h} - 5\sqrt{3})}{h} \frac{(5\sqrt{3+h} + 5\sqrt{3})}{(5\sqrt{3+h} + 5\sqrt{3})}$$

$$\lim_{h\to 0} \frac{25(3+h) - 25\cdot 3}{h(5\sqrt{3+h} + 5\sqrt{3})}$$

$$\lim_{h\to 0} \frac{\cancel{75} + 25\cancel{h} - \cancel{75}}{\cancel{h}(5\sqrt{3+h} + 5\sqrt{3})}$$

$$\frac{25}{5\sqrt{3} + 5\sqrt{3}}$$

$$\frac{25}{10\sqrt{3}}$$

$$\boxed{\frac{5}{2\sqrt{3}}}$$

6) $$\lim_{h\to 0} \frac{(6h-11)^2 - 121}{h}$$

$$\lim_{h\to 0} \frac{36h^2 - 132h + \cancel{121} - \cancel{121}}{h}$$

$$\lim_{h\to 0} \frac{\cancel{h}(36h - 132)}{\cancel{h}}$$

$$\boxed{= -132}$$

7) $\lim_{x \to -11} \frac{x^2+7x-44}{x^2-121} = \lim_{x \to -11} \frac{\cancel{(x+11)}(x-4)}{\cancel{(x+11)}(x-11)}$

$= \frac{-11-4}{-11-11}$

$= \frac{-15}{-22}$

$= \frac{15}{22}$

8) a) $C = 0.60m + 75$

b) $525

c) 1700 miles

9)

	f	f'	f''
A	−	+	−
B	+	+	−
C	−	−	+
D	−	0	+
E	−	+	+